National and State Estimates of the Drug Abuse Treatment Gap: 2000 National Household Survey on Drug Abuse

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Substance Abuse and Mental Health Services Administration
Office of Applied Studies

Acknowledgments

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Chapter 1. Description of the NHSDA

1.1 Overview

This report presents information from the 2000 National Household Survey on Drug Abuse (NHSDA) on the number and percentage of the population in the Nation and in each State who need but did not receive treatment for an illicit drug use problem, referred to as the "treatment gap."

The NHSDA is an annual survey of the civilian, noninstitutionalized population of the United States who are 12 years old or older. It is the primary source of statistical information on the use

of illegal drugs by the U.S. population. Conducted by the Federal Government since 1971, the survey collects data by administering questionnaires to a representative sample of the population through face-to-face interviews at their place of residence. The survey is sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA), and data collection is carried out by RTI of Research Triangle Park, North Carolina. The project is planned and managed by SAMHSA's Office of Applied Studies (OAS). This chapter contains a summary of the survey methodology.

1.2 NHSDA Methodology

The NHSDA collects information from residents of households, noninstitutional group quarters (e.g., shelters, rooming houses, dormitories), and civilians living on military bases. Persons excluded from the survey include homeless people who do not use shelters, active military personnel, and residents of institutional group quarters, such as jails and hospitals.

Prior to 1999, the NHSDA was conducted using a paper-and-pencil interviewing (PAPI) method, with an interview lasting about an hour. The NHSDA PAPI instrumentation consisted of a questionnaire booklet completed by an interviewer and a set of individual answer sheets completed by a respondent. All substance use questions and other sensitive questions appeared on the answer sheets so that the interviewer was not aware of the respondent's answers. Less sensitive questions, such as those on demographics, employment status, and household composition, were asked aloud by the interviewer and recorded in the questionnaire booklet.

Since 1999, the NHSDA interview has been carried out using a computer-assisted interviewing (CAI) method. The survey uses a combination of computer-assisted personal interviewing (CAPI) conducted by an interviewer and audio computer-assisted self-interviewing (ACASI). For the most part, questions previously administered by the interviewer are nowadministered by the interviewer using CAPI. Questions previously administered using answer sheets are now administered using ACASI, which is designed to provide the respondent with a highly private and confidential means of responding to questions and to increase the level of honest reporting of illicit drug use and other sensitive behaviors. Nevertheless, NHSDA estimates of treatment need and the treatment gap are based on self-reports, and their accuracy depends on respondents' truthfulness and memory. Because it is assumed that there is some level of underreporting by respondents, and because heavy drug users are believed to be underrepresented in the NHSDA sample because it is household-based, estimates of treatment need and the treatment gap based on the NHSDA are considered conservative.

Consistent with the 1999 NHSDA, the 2000 NHSDA sample employed a 50-State design with an independent, multistage area probability sample for each of the 50 States and the District of Columbia. The eight States with the largest population (which together account for 48 percent of the total U.S. population aged 12 or older) were designated as large sample States (California, Florida, Illinois, Michigan, New York, Ohio, Pennsylvania, and Texas). For these States, the design provided a sample large enough to support direct State estimates. For the remaining 42 States and the District of Columbia, smaller but adequate samples were selected to support State estimates using small area estimation (SAE) techniques. The design oversampled youths and young adults, so that each State's sample was approximately equally distributed among three age

groups: 12 to 17 years, 18 to 25 years, and 26 years or older. To enhance the precision of trend measurement, half of the first-stage sampling units (area segments) in the 1999 sample were also in the 2000 sample. However, all of the households included in the 2000 sample were new.

Nationally, 169,769 addresses were screened for the 2000 survey and 71,764 persons were interviewed within the screened addresses. The survey was conducted from January through December 2000. Weighted response rates for household screening and for interviewing were 92.8 and 73.9 percent, respectively.

1.3 Remainder of This Report

Chapter 2 presents national estimates of the need for treatment and the treatment gap. Overall treatment need and treatment gap estimates are discussed first, followed by discussion of treatment need estimates arranged by age, gender, race/ethnicity, geographic area, education, and employment. Chapter 3 focuses on State treatment gap estimates and includes a summary of the methodology used to calculate these estimates followed by the results and discussion. Two appendices also are included. Appendix A provides information on the measurement of dependence, abuse, treatment, and treatment need, and Appendix B provides technical details on the State estimation methodology.

Chapter 2. National Estimates of Treatment Need and the Treatment Gap

2.1 Overview

The 2000 National Household Survey on Drug Abuse (NHSDA) included a series of questions to assess dependence on and abuse of substances, as well as questions that asked whether respondents had received treatment for a problem related to substance use. The dependence and abuse questions were designed to measure dependence and abuse based on the diagnostic criteria specified in the 4th edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) (American Psychiatric Association [APA], 1994). Questions on dependence asked about health, emotional problems, attempts to cut down on use, tolerance, withdrawal, and other symptoms associated with the substances used. Questions on abuse asked about problems at work, home and school; problems with family or friends; physical danger; and trouble with the law due to substances used. Dependence reflects a more severe substance use problem than abuse; persons were classified with abuse of a particular substance only if they were not dependent on that substance.

This report provides estimates of the prevalence and patterns of the need for and receipt of treatment specifically for problems associated with illicit drug use. It presents estimates of the

"treatment gap," defined as persons who needed treatment in the past year but did not receive that treatment. An individual was defined as needing treatment if he or she was dependent on or had abused an illicit drug or received treatment for an illicit drug problem at a "specialty" substance abuse facility in the past 12 months (i.e., during the 12 months before being interviewed). "Specialty" facilities include drug and alcohol rehabilitation facilities (inpatient or outpatient), hospitals (inpatient only), and mental health centers. It should be noted that respondents who were not dependent on or abusing drugs but who had received specialty treatment were counted as needing treatment under this definition. This was appropriate because it was assumed that a diagnostic assessment determining treatment need was done prior to entry into treatment.

This chapter presents estimates of the treatment gap at the national level, including estimates of the need for and receipt of treatment for an illicit drug problem by demographic characteristics (see Tables 1 to 5 at the end of the chapter). Due to changes to the NHSDA questionnaire and to the definitions and estimation methods used for measuring treatment need, the estimates in this report are not comparable with prior estimates. Based on cognitive testing, questions to measure dependence in 1999 were revised to improve how well the questions were understood by respondents. These questions were also revised based on a review by experts in the field to determine how well the questions capture the meaning of the DSM-IV criteria. In addition, starting with the 2000 NHSDA, questions to measure abuse based on the DSM-IV were added to the NHSDA and a new method for estimating treatment need and the gap was employed. This new method uses a simpler and more widely accepted definition of treatment need (abuse and dependence) and does not employ a ratio adjustment to inflate the NHSDA numbers based on separate counts of the treatment and arrestee populations (Wright, Gfroerer, & Epstein, 1997). This adjustment did not produce estimates as accurate as those generated by the new approach. Therefore, the treatment gap estimate of 3.9 million in 2000 cannot be compared with earlier estimates from 1991 to 1998 that ranged from 2.5 million to 3.6 million individuals. Additionally, the previous ratio-adjusted treatment need and gap estimates were made only at the national level and were used by the Office of National Drug Control Policy (ONDCP) in its annual *National Drug Control Strategy* (see ONDCP, 2000). A more detailed description of the changes to the NHSDA methods for generating these estimates is given in Appendix A.

2.2 Overall Estimates of Treatment Need

- In 2000, an estimated 4.7 million people aged 12 or older (2.1 percent of the total population) needed treatment for an illicit drug abuse problem. This includes 2.8 million classified by the survey with illicit drug dependence, 1.5 million classified with illicit drug abuse, and another 0.3 million who received specialty treatment but were not classified as dependent or abusing.
- Of the 4.7 million people needing treatment, 0.8 million people (16.6 percent of the people who needed treatment) received treatment at a specialty facility.
- The treatment gap was estimated to be 3.9 million people in 2000, or 1.7 percent of the total population.
- Of the 3.9 million people who needed but did not receive treatment in 2000, an estimated 381,000 reported that they felt they needed treatment for their drug problem. This

includes an estimated 129,000 who reported that they had made an effort but were unable to get treatment and 252,000 who reported making no effort to get treatment.

- Among the 3.9 million people who needed but did not receive treatment in 2000, 62.3 percent were classified with drug dependence and 37.7 percent were classified with drug abuse. However, among the estimated 381,000 persons who felt they needed treatment for a drug problem, 88.5 percent were classified with drug dependence and 11.5 percent were classified with drug abuse.

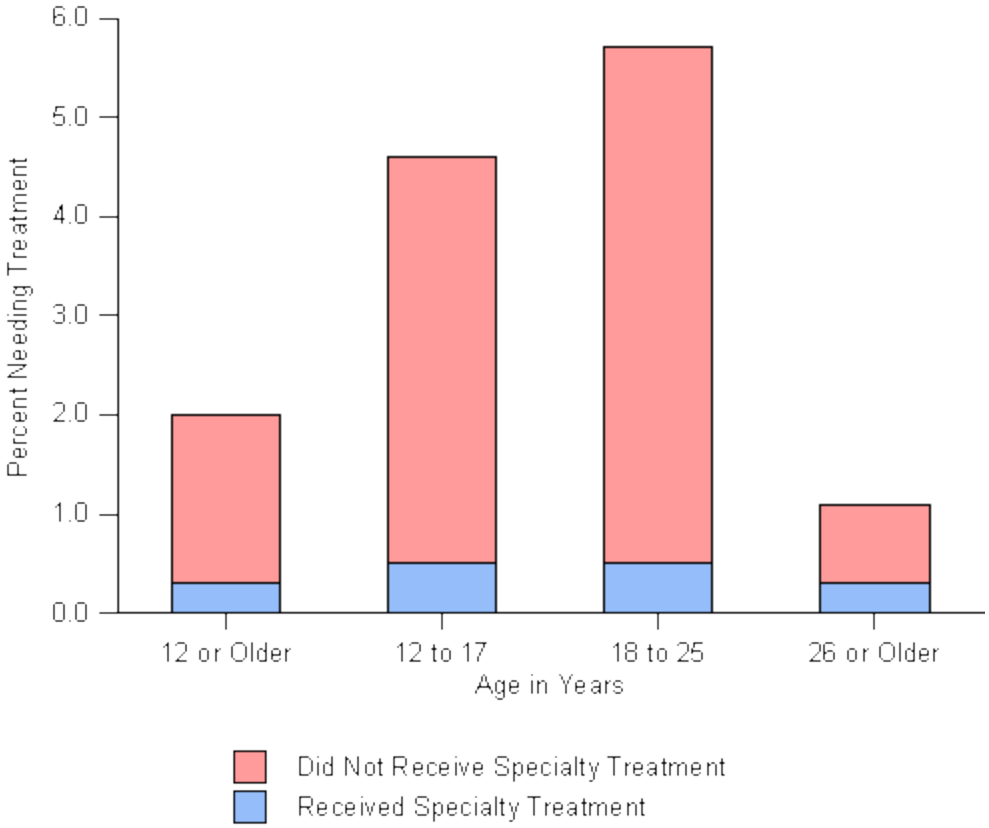
2.3 Treatment Need, by Age

- For the youngest age group (12 to 17), an estimated 1.1 million persons (4.6 percent of this population) needed treatment for an illicit drug abuse problem in 2000. Of this group, only 0.1 million people (11.4 percent of the people aged 12 to 17 years who needed treatment) received treatment, leaving an estimated treatment gap for youths of 1.0 million (Figures 1 and 2).
- The percent of the population in 2000 who needed treatment for an illicit drug use problem was highest among persons aged 18 to 25 years (5.7 percent) and lowest among persons aged 26 and older (1.1 percent). An estimated 1.6 million persons aged 18 to 25 and 1.9 million persons aged 26 and older needed treatment for an illicit drug problem in 2000.
- Among the estimated 381,000 persons who did not receive treatment but reported that they felt they needed treatment for their drug problem in 2000, 74,000 were aged 12 to 17, 103,000 were aged 18 to 25, and 204,000 were aged 26 and older. Thus, the percentage of the treatment gap that felt they needed treatment was 7.8 percent for those aged 12 to 17, 6.9 percent for those aged 18 to 25, and 14.3 percent for those aged 26 and older.

2.4 Treatment Need, by Gender

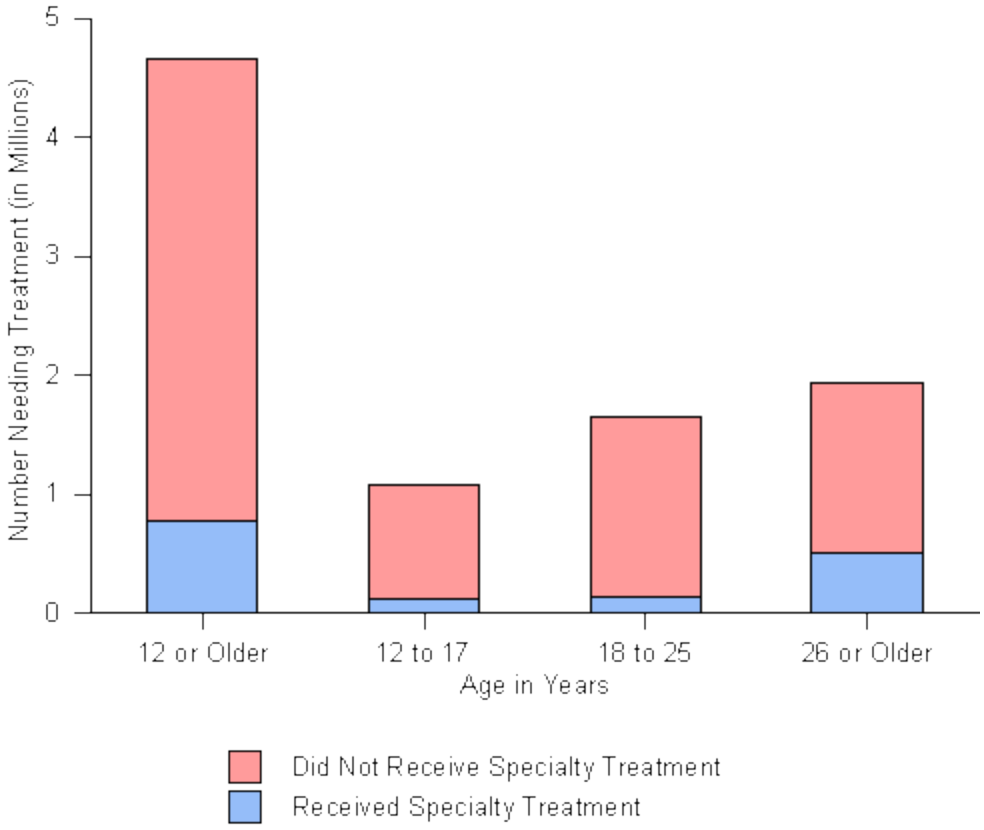
- Among persons aged 12 or older in 2000, the percentage of males needing treatment for an illicit drug problem was higher than the percentage of females needing treatment (2.6 vs. 1.6 percent). This translates to 2.7 million males and 1.9 million females needing treatment. On the other hand, the percentage receiving specialty treatment among those needing treatment was higher for females than males (19.0 vs. 15.0 percent). However, this was not a statistically significant difference.
- Among youths aged 12 to 17 in 2000, the percentage of males needing treatment for an illicit drug problem was higher than the percentage of females needing treatment (5.0 vs. 4.2 percent). The percentage receiving specialty treatment among youths needing treatment was higher for males than females (13.0 vs. 9.4 percent). This was not a statistically significant difference.

Figure 1 Percentages of Persons with Past Year Illicit Drug Abuse Treatment Need and Receipt, by Age: 2000



Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.

Figure 2 Numbers of Persons with Past Year Illicit Drug Abuse Treatment Need and Receipt, by Age: 2000



Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.

2.5 Treatment Need, by Race/Ethnicity

- In 2000, 2.0 percent of whites aged 12 or older needed treatment for an illicit drug problem. The percentage needing treatment was about the same among blacks and Hispanics (2.5 and 2.4 percent, respectively). The highest rates of those needing treatment were for persons reporting more than one race (5.5 percent) and for American Indians/Alaska Natives (4.3 percent); the lowest rate was for Asians (0.7 percent).
- Among whites needing treatment, 17.8 percent received treatment at a specialty facility. Only 9.0 percent of all Hispanics needing treatment received treatment. The percentage receiving treatment among blacks who needed treatment was 18.6 percent, although the sampling error associated with this estimate is large and the estimate is not shown in the tables.
- Whites accounted for most of the illicit drug treatment need in 2000. Of the 4.7 million persons needing treatment, 3.2 million (69 percent) were white. Whites accounted for 75 percent of the persons who received specialty treatment for an illicit drug problem in 2000.

2.6 Treatment Need, by Geographic Area

- The percentage of persons needing treatment for an illicit drug problem was lowest in the East South Central division (1.6 percent) and highest in the New England division (3.2 percent) in 2000.
- The percentage of persons needing treatment for an illicit drug problem in 2000 was essentially the same for persons in large metropolitan counties, small metropolitan counties, and urbanized nonmetropolitan counties (2.3, 2.0, and 2.0 percent, respectively). The percentage needing treatment was lowest in completely rural counties (1.2 percent).

2.7 Treatment Need, by Education

- Needing treatment is inversely related to educational status. Among adults aged 18 or older in 2000, those who had not completed high school had the highest percentage of persons needing treatment (2.9 percent), while college graduates had the lowest percentage of persons needing treatment for illicit drugs (1.1 percent). The percentage who received treatment among persons who needed treatment was 25.4 percent among those with less than a high school education.

2.8 Treatment Need, by Employment

- Current employment status also correlated with treatment need in 2000. An estimated 7.7 percent of unemployed adults aged 18 or older needed treatment for illicit drugs, while only 1.6 percent of full-time employed adults needed treatment for an illicit drug problem.
- Most of the adult population needing treatment for an illicit drug problem in 2000 was employed. Of the estimated 3.6 million persons aged 18 or older who needed treatment, 1.9 million were employed full time and 0.6 million were employed part time. Thus, an estimated 70 percent of adults needing treatment were employed. An estimated 359,000 unemployed adults needed treatment.

Table 1. Estimated Numbers (in Thousands) of Persons Aged 12 or Older Who Needed and Received Treatment for an Illicit Drug Problem in the Past Year, by Demographic Characteristics: 2000

Demographic Characteristic	Needed Treatment for an Illicit Drug Problem in the Past Year			Percentage Who Received Treatment at a Specialty Facility Among Persons Who
	Total	Received Treatment at a Specialty Facility	Did Not Receive Treatment at a Specialty Facility	

				Needed Treatment
Total	4,655	774	3,881	16.6
Age in Years				
12-17	1,074	122	951	11.4
18-25	1,645	142	1,503	8.6
26 or older	1,937	510	1,427	26.3
Gender				
Male	2,749	411	2,337	15.0
Female	1,907	363	1,544	19.0
Hispanic Origin and Race				
Not Hispanic				
White only	3,235	577	2,659	17.8
Black only	632	118	514	*
American Indian or Alaska Native only	46	4	42	*
Native Hawaiian or other Pacific Islander	10	3	7	*
Asian only	54	1	54	*
More than one race	103	21	82	*
Hispanic	574	51	523	9.0

*Low precision; no estimate reported.

Note: Respondents were classified as needing treatment for an illicit drug problem if they met at least one of three criteria during the past year: (1) dependent on any illicit drug; (2) abuse of any illicit drug; or (3) received treatment for an illicit drug problem at a specialty facility (i.e., drug and alcohol rehabilitation facilities [inpatient or outpatient], hospitals [inpatient only], and mental health centers). Illicit Drugs include marijuana/hashish, cocaine (including crack), inhalants, hallucinogens, heroin, or prescription-type psychotherapeutic (nonmedical use).

Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.

Table 2. Percentages of Persons Aged 12 or Older Who Needed and Received Treatment for an Illicit Drug Problem in the Past Year, by *Demographic Characteristics*: 2000

Demographic Characteristic	Needed Treatment for an Illicit Drug Problem in the Past Year			Percentage Who Received Treatment at a Specialty Facility Among Persons Who Needed Treatment
	Total	Received Treatment at a Specialty Facility	Did Not Receive Treatment at a Specialty Facility	
Total	2.1	0.3	1.7	16.6
Age in Years				
12-17	4.6	0.5	4.1	11.4
18-25	5.7	0.5	5.2	8.6
26 or older	1.1	0.3	0.8	26.3
Gender				
Male	2.6	0.4	2.2	15.0
Female	1.6	0.3	1.3	19.0
Hispanic Origin and Race				
Not Hispanic				
White only	2.0	0.4	1.6	17.8
Black only	2.5	0.5	2.0	*

American Indian or Alaska Native only	4.3	0.4	3.9	*
Native Hawaiian or other Pacific Islander	1.8	0.5	1.4	*
Asian only	0.7	0.0	0.7	*
More than one race	5.5	1.1	4.4	*
Hispanic	2.4	0.2	2.2	9.0

*Low precision; no estimate reported.

NOTE: Respondents were classified as needing treatment for an illicit drug problem if they met at least one of three criteria during the past year: (1) dependent on any illicit drug; (2) abuse of any illicit drug; or (3) received treatment for an illicit drug problem at a specialty facility (i.e., drug and alcohol rehabilitation facilities [inpatient or outpatient], hospitals [inpatient only], and mental health centers). Illicit Drugs include marijuana/hashish, cocaine (including crack), inhalants, hallucinogens, heroin, or prescription-type psychotherapeutic (nonmedical use).

Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.

Table 3. Percentages of Persons *Aged 12 or Older* Who Needed and Received Treatment for an Illicit Drug Problem in the Past Year, by *Geographic Characteristics*: 2000

Geographic Characteristic	Needed Treatment for an Illicit Drug Problem in the Past Year			Percentage Who Received Treatment at a
	Total	Received Treatment at a Specialty Facility	Did Not Receive Treatment at a Specialty Facility	

				Specialty Facility Among Persons Who Needed Treatment
Total	2.1	0.3	1.7	16.6
Geographic Division				
Northeast	2.4	0.4	2.0	17.2
New England	3.2	0.7	2.6	*
Middle Atlantic	2.1	0.3	1.8	15.3
Midwest	1.8	0.3	1.5	17.8
East North Central	1.9	0.3	1.6	16.1
West North Central	1.7	0.4	1.4	*
South	1.7	0.3	1.4	17.3
South Atlantic	1.7	0.3	1.4	20.0
East South Central	1.6	0.2	1.4	10.1
West South Central	1.8	0.3	1.5	16.6
West	2.7	0.4	2.3	14.7
Mountain	2.8	0.4	2.4	13.9
Pacific	2.7	0.4	2.3	*
County Type				
Large metro	2.3	0.4	1.9	16.2
Small metro	2.0	0.3	1.7	15.5
250K - 1 mil. pop.	2.0	0.3	1.7	15.1

. <250K pop	2.0	0.3	1.7	16.7
Nonmetro	1.7	0.3	1.4	20.0
Urbanized	2.0	0.5	1.5	*
Less urbanized	1.7	0.3	1.4	*
Completely rural	1.2	0.2	1.0	*

*Low precision; no estimate reported.

NOTE: Respondents were classified as needing treatment for an illicit drug problem if they met at least one of three criteria during the past year: (1) dependent on any illicit drug; (2) abuse of any illicit drug; or (3) received treatment for an illicit drug problem at a specialty facility (i.e., drug and alcohol rehabilitation facilities [inpatient or outpatient], hospitals [inpatient only], and mental health centers). Illicit Drugs include marijuana/hashish, cocaine (including crack), inhalants, hallucinogens, heroin, or prescription-type psychotherapeutic (nonmedical use).

Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.

Table 4. Percentages of Persons *Aged 12 to 17* Who Needed and Received Treatment for an Illicit Drug Problem in the Past Year, by *Demographic Characteristics*: 2000

Demographic Characteristic	**Needed Treatment for an Illicit Drug Problem in the Past Year**			**Percentage Who Received Treatment at a Specialty Facility Among Persons Who Needed Treatment**
	Total	**Received Treatment at a Specialty Facility**	**Did Not Receive Treatment at a Specialty Facility**	
Total	4.6	0.5	4.1	11.4
Gender				

Male	5.0	0.6	4.3	13.0
Female	4.2	0.4	3.8	9.4
Hispanic Origin and Race				
Not Hispanic				
White only	4.8	0.6	4.2	12.6
Black only	3.6	0.5	3.1	13.5
American Indian or Alaska Native only	10.7	*	8.7	*
Native Hawaiian or other Pacific Islander	*	*	*	*
Asian only	2.8	*	2.8	*
More than one race	2.5	*	2.5	*
Hispanic	5.2	0.3	4.9	6.1
Gender/Race/Hispanic Origin				
Male - white	5.0	0.7	4.3	13.7
Female - white	4.5	0.5	4.0	11.4
Male - black	4.7	0.8	3.9	*
Female - black	2.4	0.2	2.3	*
Male - Hispanic	5.3	0.4	4.9	*
Female - Hispanic	5.0	0.2	4.8	*

*Low precision; no estimate reported.

NOTE: Respondents were classified as needing treatment for an illicit drug problem if they met at least one of three criteria during the past year: (1) dependent on any illicit drug; (2) abuse of any illicit drug; or (3) received treatment for an illicit drug problem at a specialty facility (i.e., drug and alcohol rehabilitation facilities [inpatient or outpatient], hospitals [inpatient only], and mental health centers). Illicit Drugs include marijuana/hashish, cocaine (including crack), inhalants, hallucinogens, heroin, or prescription-type psychotherapeutic (nonmedical use).

Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.

Table 5. Percentages of Persons *Aged 18 or Older* Who Needed and Received Treatment for an Illicit Drug Problem in the Past Year, by *Demographic Characteristics*: 2000

Demographic Characteristic	Needed Treatment for an Illicit Drug Problem in the Past Year			Percentage Who Received Treatment at a Specialty Facility Among Persons Who Needed Treatment
	Total	Received Treatment at a Specialty Facility	Did Not Receive Treatment at a Specialty Facility	
Total	1.8	0.3	1.5	18.2
Gender				
Male	2.3	0.4	1.9	15.5
Female	1.4	0.3	1.1	22.3
Hispanic Origin and Race				
Not Hispanic				
White only	1.7	0.3	1.4	19.3
Black only	2.3	0.5	1.9	*
American Indian or Alaska Native only	3.3	0.1	3.1	*
Native Hawaiian or other Pacific Islander	1.7	0.5	1.2	*
Asian only	0.5	0.0	0.4	*
More than	6.3	1.4	4.9	*

one race				
Hispanic	2.0	0.2	1.8	10.2
Adult Education				
< High school	2.9	0.7	2.2	25.4
High school graduate	1.7	0.3	1.4	18.9
Some college	1.9	0.3	1.6	15.8
College graduate	1.1	0.1	1.0	*
Current Employment				
Full-time	1.6	0.2	1.4	14.1
Part-time	2.7	0.5	2.2	*
Unemployed	7.7	1.5	6.2	*
Other[1]	1.3	0.4	0.9	28.8

* Low precision; no estimate reported.

NOTE: Respondents were classified as needing treatment for an illicit drug problem if they met at least one of three criteria during the past year: (1) dependent on any illicit drug; (2) abuse of any illicit drug; or (3) received treatment for an illicit drug problem at a specialty facility (i.e., drug and alcohol rehabilitation facilities [inpatient or outpatient], hospitals [inpatient only], and mental health centers). Illicit Drugs include marijuana/hashish, cocaine (including crack), inhalants, hallucinogens, heroin, or prescription-type psychotherapeutic (nonmedical use).

[1] Retired, disabled, homemaker, student, or "other."

Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.

Chapter 3. Estimates of the Treatment Gap, by State

3.1 Summary of Methodology

This chapter presents State estimates of the percentages and numbers of persons needing but not receiving treatment for illicit drug use (see Tables 6 to 9 at the end of the chapter). The following discusses how the State estimates of the treatment gap are calculated. A more detailed discussion of this process is provided in Appendix B of this report.

For each respondent in the sample, one can determine whether a person needed but did not receive treatment for an illicit drug problem based on the following definition: An individual was counted in the treatment gap if he or she was dependent on or had abused an illicit drug but had not received treatment for his or her illicit drug problem at a "specialty" substance abuse facility in the past 12 months (i.e., in the 12 months before being interviewed). "Specialty" substance abuse facilities include drug and alcohol rehabilitation facilities (inpatient or outpatient), hospitals (inpatient only), and mental health centers.

The State estimates are based on a model that has essentially two components. One component is a national model using data from the 2000 National Household Survey on Drug Abuse (NHSDA). The national model includes demographic information (such as age and race), socioeconomic information on the local area (such as the percentage below the poverty level), and information specific to drug use (such as the marijuana possession arrest rate for the county). The information used in the national model is available at the Census block, Census tract, or county level.

The second component of the model is the information collected from the NHSDA respondents in each State. This direct sample component adjusts the results to reflect State- and local-level differences. These two components together produce the final estimate. In effect, for each State, two estimates of the treatment gap—one from a national model and one from just the sample data from the State—are combined to make the best estimate for the State. If a State is represented in the survey by a relatively small sample, and the direct sample estimate from the State is subject to significant sampling variation, more weight is given to the national component.

When the process is complete, the results are validated by comparing the estimates produced by the model with estimates based entirely on the sample data. This is done for areas having very large samples that can be assumed to produce "accurate" estimates without the need for models. The validation results showed that the model-based estimates for all persons aged 12 or older were quite accurate compared with the true (gold standard) State value—on average,within about 4 percent of the true value. For example, if the true value in a State was 2 percent, the estimate would typically be within 0.08 of a percent of the true value.

The final set of State estimates also comes with a corresponding set of interval estimates within which the true State value will fall 95 percent of the time. For example, the estimate of the percentage treatment gap for the State of Idaho, for persons aged 12 or older, is 1.81 percent, with a prediction interval of (1.41, 2.28). Therefore, the probability is 95 percent that the true value for Idaho lies between 1.41 and 2.28 percent. The model-based estimates were also more precise than the corresponding survey-based estimates based on the sample only. The prediction intervals were on average 45 percent smaller (better) than the corresponding confidence intervals (CIs) around the strictly sample-based estimates. This superior precision is equivalent to an effective sample size of 3,300 as opposed to the true design-based sample size of 1,000. Comparisons for the specific age groups are provided in Appendix B.

A national map (Figure 3) illustrates the distribution of State estimates of the percentage treatment gap into "fifths" from lowest to highest. States with the highest treatment gap as a

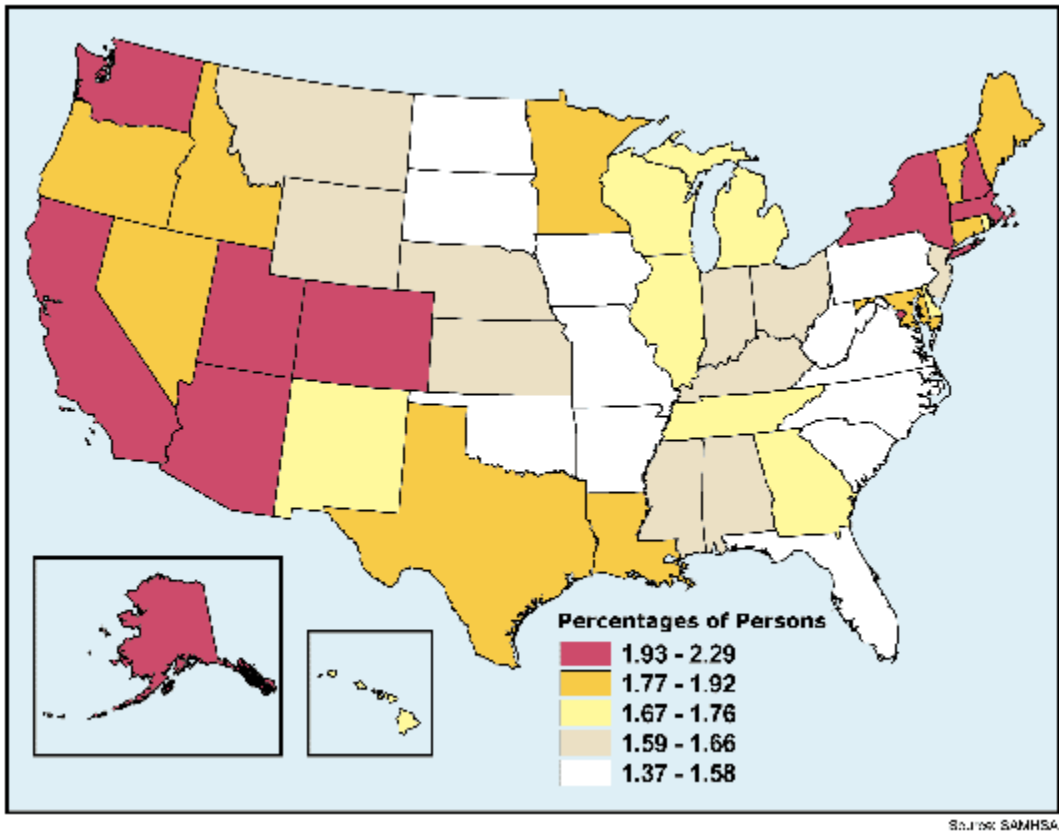
percentage of their population fall into the top quintile and are in red. States with the lowest treatment gaps are in the bottom quintile and are in white.[1] Typically, most States cluster around the national average, and some may only differ by a fraction of a percent. Therefore, it is important to consider the interval in determining the relative ranking of States.

3.2 Results

Nationally, 1.74 percent of persons aged 12 or older needed treatment but did not receive it in the past year.[2]

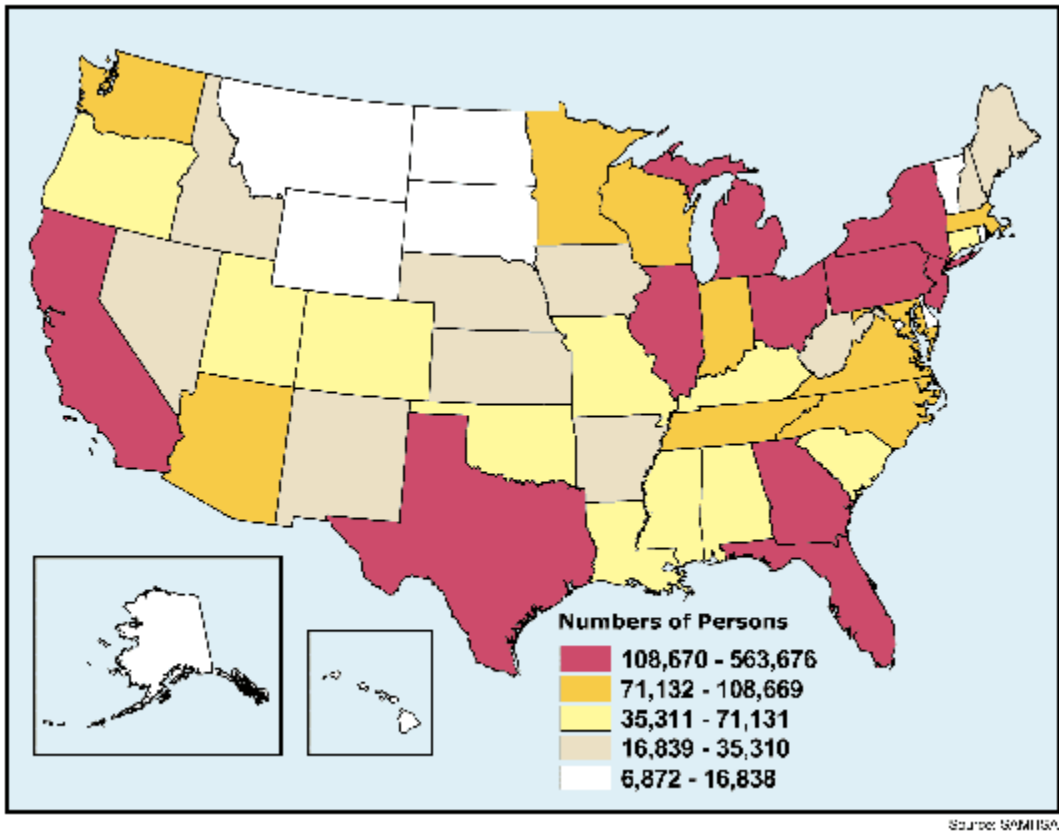
- Of the 10 States with the highest percentage treatment gaps, 6 were Western States and 3 were Northeastern States. Arizona had the highest percentage treatment gap of 2.29 percent.

Figure 3 Percentages of Persons Aged 12 or Older Needing But Not Receiving Treatment for an Illicit Drug Problem in the Past Year, by State: 2000



Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.

Figure 4 Numbers of Persons Aged 12 or Older Needing But Not Receiving Treatment for an Illicit Drug Problem in the Past Year, by State: 2000



Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.

- Although the 12 to 25 age group represented only about 23 percent of the total population aged 12 or older, nationally it constituted the majority of the treatment gap. About 62 percent of all persons in the gap were in this age group. The 12 to 25 age group constituted anywhere from 51 percent (Washington) to 73 percent (Idaho) of the total number of persons in the treatment gap, depending on the State. Most of the States in the highest group for the treatment gap percentage had proportions of 12 to 25 year olds comprising their treatment gap that were lower than the national average.
- In the lowest fifth, five States were Southern States, and four were Midwestern. The State with the lowest treatment gap for ages 12 or older was Iowa with an estimate of 1.37 percent of the population.
- Generally, as might be expected, States with larger populations had the largest estimated number of persons in the treatment gap. California had the largest number of persons in the gap, approximately 564,000, representing 14.1 percent of the national gap for persons 12 or older. The other States with large treatment gap counts were Texas (288,000), New York (285,000), Florida (196,000), Illinois (164,000), Pennsylvania (160,000), Ohio (150,000), Michigan (138,000), New Jersey (110,000), and Georgia (110,000).
- Because the range in State population sizes was larger than the range in the estimated State treatment gap percentages, the population size had a dominant impact on the

treatment gap counts. Variations in the State percentage gap, however, resulted in significant differences among States of a similar size. For example, Arizona and Alabama had similar population sizes in 2000; however, for persons aged 12 or older, Arizona had a larger treatment gap (89,000) than Alabama (61,000) because of its higher treatment gap percentage (2.29 vs. 1.66 percent).

3.3 Discussion

These State-level estimates of the drug abuse treatment gap provide an important tool for treatment planners and policymakers at the Federal, State, and local levels. They represent the first available State estimates of the gap using a consistent methodology to allow valid comparisons across States. Although it is difficult to accurately measure characteristics affecting less than 2 percent of the population, the methodology used was able to identify significant variation in the treatment gap by State. The estimates ranged from as low as 1.37 percent up to 2.29 percent of the States' populations aged 12 or older, indicating very real differences in the unmet treatment need across States. In an average-sized State, such as Maryland, this size difference represents tens of thousands of persons.

The treatment gap estimates give a single measure of the illicit drug problem in each State. More detailed assessments of problems at the State level, such as analysis of demographic differences and access to care, are not possible with these data. These issues can only be studied with the NHSDA at the national level. Interpretation of State-level patterns in the treatment gap can also be aided by using these estimates in conjunction with other measures produced at the State level from the NHSDA, such as rates of current use, initiation, and perceived risk of harm for illicit drugs and also for alcohol and tobacco.

Table 6. Percentages of Persons Aged 12 or Older Needing But Not Receiving Treatment for an Illicit Drug Problem in the Past Year, by State, Ranked from Highest to Lowest: 2000

State	Percentages			
	Estimate	Prediction Interval		
Arizona	2.29	(1.60	-	3.18)
California	2.19	(1.79	-	2.65)
Alaska	2.12	(1.56	-	2.80)
Massachusetts	2.11	(1.56	-	2.79)
Utah	2.11	(1.59	-	2.75)
Colorado	2.09	(1.55	-	2.75)
District of Columbia	2.08	(1.53	-	2.78)
New Hampshire	1.97	(1.52	-	2.51)
Washington	1.97	(1.39	-	2.71)

New York	1.93	(1.58	-	2.33)
Connecticut	1.92	(1.45	-	2.49)
Oregon	1.92	(1.42	-	2.54)
Vermont	1.92	(1.48	-	2.44)
Minnesota	1.90	(1.43	-	2.49)
Maryland	1.89	(1.40	-	2.48)
Louisiana	1.83	(1.44	-	2.31)
Idaho	1.81	(1.41	-	2.28)
Nevada	1.81	(1.36	-	2.35)
Maine	1.80	(1.38	-	2.29)
Texas	1.79	(1.49	-	2.14)
Delaware	1.76	(1.30	-	2.31)
Michigan	1.74	(1.46	-	2.05)
Georgia	1.73	(1.31	-	2.23)
Hawaii	1.73	(1.15	-	2.48)
New Mexico	1.73	(1.31	-	2.24)
Wisconsin	1.71	(1.34	-	2.15)
Rhode Island	1.70	(1.29	-	2.19)
Tennessee	1.69	(1.29	-	2.17)
Illinois	1.68	(1.38	-	2.03)
Alabama	1.66	(1.26	-	2.15)
Indiana	1.66	(1.28	-	2.10)
New Jersey	1.64	(1.24	-	2.13)
Kansas	1.63	(1.20	-	2.16)
Kentucky	1.63	(1.26	-	2.07)
Mississippi	1.63	(1.25	-	2.09)
Ohio	1.62	(1.33	-	1.94)
Nebraska	1.61	(1.23	-	2.06)
Wyoming	1.61	(1.22	-	2.10)
Montana	1.60	(1.22	-	2.05)
Arkansas	1.58	(1.22	-	2.00)
Oklahoma	1.58	(1.20	-	2.06)
Pennsylvania	1.58	(1.32	-	1.88)
Florida	1.55	(1.26	-	1.87)
North Carolina	1.55	(1.17	-	2.02)
Virginia	1.55	(1.16	-	2.04)
South Carolina	1.54	(1.16	-	2.01)

North Dakota	1.49	(1.14	-	1.92)
South Dakota	1.49	(1.13	-	1.92)
Missouri	1.48	(1.11	-	1.94)
West Virginia	1.47	(1.10	-	1.92)
Iowa	1.37	(1.02	-	1.82)

Note: Estimates are based on a survey-weighted hierarchical Bayes estimation approach, and the prediction (credible) intervals are generated by Markov Chain Monte Carlo techniques. Horizontal rules refer to quintile divisions shown in Figure 3.

Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.

Table 7. Estimated Numbers of Persons Aged 12 or Older Needing But Not Receiving Treatment for an Illicit Drug Problem in the Past Year, by State, Ranked from Highest to Lowest: 2000

State	Total			
	Estimate	Prediction Interval		
California	563,676	(461,420	-	681,354)
Texas	287,765	(238,763	-	343,704)
New York	285,054	(233,386	-	344,527)
Florida	196,128	(160,449	-	237,262)
Illinois	164,309	(134,517	-	198,622)
Pennsylvania	160,117	(133,536	-	190,349)
Ohio	150,150	(123,896	-	180,234)
Michigan	137,607	(115,803	-	162,255)
New Jersey	110,186	(83,020	-	143,273)
Georgia	110,012	(83,253	-	141,784)
Massachusetts	108,669	(79,822	-	142,946)
North Carolina	98,671	(74,303	-	128,412)
Washington	94,245	(66,323	-	129,778)
Arizona	88,686	(61,861	-	122,928)
Virginia	87,768	(65,335	-	115,360)
Indiana	82,093	(63,426	-	104,093)
Maryland	80,734	(59,889	-	106,368)
Tennessee	78,992	(60,266	-	101,055)
Wisconsin	75,832	(58,708	-	94,080)
Minnesota	75,663	(56,404	-	98,355)

Colorado	71,131	(52,786	-	93,664)
Missouri	67,487	(50,268	-	88,011)
Louisiana	65,208	(51,141	-	82,168)
Alabama	60,846	(46,033	-	78,487)
Oregon	54,906	(40,135	-	71,855)
Kentucky	53,647	(41,501	-	67,985)
Connecticut	52,010	(39,045	-	67,330)
South Carolina	48,469	(36,463	-	62,805)
Oklahoma	43,449	(32,808	-	56,404)
Mississippi	37,181	(28,302	-	47,497)
Utah	36,474	(27,201	-	47,167)
Kansas	35,310	(25,915	-	46,538)
Arkansas	34,202	(26,365	-	43,209)
Iowa	32,845	(24,272	-	43,409)
Nevada	27,941	(21,071	-	36,296)
New Mexico	25,748	(19,531	-	33,350)
West Virginia	22,959	(17,142	-	29,879)
Nebraska	22,267	(16,953	-	28,303)
New Hampshire	19,883	(15,317	-	25,333)
Idaho	19,700	(15,320	-	24,692)
Maine	18,817	(14,469	-	24,008)
Hawaii	16,838	(11,247	-	24,197)
Rhode Island	13,983	(10,600	-	17,959)
Montana	12,396	(9,491	-	15,863)
Delaware	11,100	(8,216	-	14,555)
Alaska	10,381	(7,654	-	13,748)
Vermont	9,810	(7,568	-	12,500)
South Dakota	9,262	(7,010	-	11,863)
District of Columbia	8,820	(6,463	-	11,764)
North Dakota	8,019	(6,077	-	10,276)
Wyoming	6,872	(5,174	-	8,915)

Note: Estimates are based on a survey-weighted hierarchical Bayes estimation approach, and the prediction (credible) intervals are generated by Markov Chain Monte Carlo techniques. Horizontal rules refer to quintile divisions shown in Figure 4.

Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.

Table 8. Percentages of Persons Aged 12 or Older Needing But Not Receiving Treatment for an Illicit Drug Problem in the Past Year, by State: 2000

State	Total		Age Group (Years)					
			12-17		18-25		26 or Older	
	Estimate	Prediction Interval	Estimate	Prediction Interval	Estimate	Prediction Interval	Estimate	Prediction Interval
Total[1]	1.79		4.12		5.22		0.89	
Alabama	1.66	(1.26 - 2.15)	3.52	(2.32 - 5.13)	5.64	(3.94 - 7.79)	0.75	(0.41 - 1.25)
Alaska	2.12	(1.56 - 2.80)	4.60	(2.91 - 6.90)	4.83	(3.26 - 6.86)	1.14	(0.59 - 1.98)
Arizona	2.29	(1.60 - 3.18)	4.50	(3.06 - 6.36)	5.02	(3.49 - 6.96)	1.48	(0.74 - 2.65)
Arkansas	1.58	(1.22 - 2.00)	4.23	(2.94 - 5.88)	5.15	(3.65 - 7.04)	0.62	(0.33 - 1.07)
California	2.19	(1.79 - 2.65)	5.16	(4.29 - 6.15)	4.90	(3.92 - 6.04)	1.26	(0.82 - 1.86)
Colorado	2.09	(1.55 - 2.75)	4.52	(3.08 - 6.36)	5.36	(3.71 - 7.45)	1.18	(0.64 - 2.00)
Connecticut	1.92	(1.45 - 2.49)	5.28	(3.54 - 7.54)	6.54	(4.54 - 9.06)	0.86	(0.47 - 1.45)
Delaware	1.76	(1.30 - 2.31)	4.24	(2.95 - 5.88)	4.73	(3.23 - 6.66)	0.95	(0.52 - 1.61)
District of Columbia	2.08	(1.53 - 2.78)	4.21	(2.69 - 6.27)	4.84	(3.27 - 6.88)	1.29	(0.71 - 2.15)
Florida	1.55	(1.26 - 1.87)	4.04	(3.14 - 5.11)	5.21	(4.14 - 6.47)	0.76	(0.48 - 1.15)
Georgia	1.73	(1.31 - 2.23)	4.01	(2.83 - 5.50)	4.86	(3.40 - 6.72)	0.85	(0.46 - 1.44)
Hawaii	1.73	(1.15 - 2.48)	5.29	(3.40 - 7.82)	3.80	(2.45 - 5.60)	0.97	(0.41 - 1.95)
Idaho	1.81	(1.41 - 2.28)	4.17	(2.82 - 5.93)	5.48	(3.91 - 7.44)	0.67	(0.38 - 1.09)
Illinois	1.68	(1.38 - 2.03)	3.51	(2.72 - 4.44)	5.00	(3.99 - 6.18)	0.86	(0.55 - 1.27)
Indiana	1.66	(1.28 - 2.10)	3.75	(2.56 - 5.30)	5.40	(3.86 - 7.32)	0.71	(0.41 - 1.17)
Iowa	1.37	(1.02 - 1.82)	3.20	(2.04 - 4.77)	4.42	(2.94 - 6.36)	0.59	(0.32 - 1.01)
Kansas	1.63	(1.20 - 2.16)	3.01	(1.88 - 4.57)	4.58	(3.14 - 6.44)	0.90	(0.50 - 1.51)

Kentucky	1.63	(1.26	-	2.07)	4.00	(2.76	-	5.59)	5.24	(3.68	-	7.22)	0.70	(0.39	-	1.15)
Louisiana	1.83	(1.44	-	2.31)	3.99	(2.73	-	5.61)	5.57	(3.95	-	7.61)	0.75	(0.41	-	1.25)
Maine	1.80	(1.38	-	2.29)	5.31	(3.57	-	7.58)	6.23	(4.32	-	8.65)	0.70	(0.38	-	1.18)
Maryland	1.89	(1.40	-	2.48)	4.71	(3.25	-	6.59)	5.26	(3.65	-	7.31)	1.02	(0.54	-	1.75)
Massachusetts	2.11	(1.56	-	2.79)	5.59	(3.87	-	7.79)	6.00	(4.23	-	8.23)	1.09	(0.58	-	1.88)
Michigan	1.74	(1.46	-	2.05)	4.14	(3.27	-	5.15)	6.00	(4.82	-	7.36)	0.68	(0.43	-	1.02)
Minnesota	1.90	(1.43	-	2.49)	4.29	(2.99	-	5.94)	4.97	(3.46	-	6.91)	1.02	(0.54	-	1.74)
Mississippi	1.63	(1.25	-	2.09)	3.27	(2.16	-	4.75)	5.12	(3.56	-	7.10)	0.72	(0.41	-	1.18)
Missouri	1.48	(1.11	-	1.94)	3.16	(2.03	-	4.68)	4.61	(3.17	-	6.47)	0.72	(0.38	-	1.24)
Montana	1.60	(1.22	-	2.05)	4.68	(3.07	-	6.79)	4.63	(3.21	-	6.43)	0.65	(0.35	-	1.09)
Nebraska	1.61	(1.23	-	2.06)	3.38	(2.20	-	4.95)	5.15	(3.64	-	7.05)	0.71	(0.38	-	1.20)
Nevada	1.81	(1.36	-	2.35)	4.65	(3.09	-	6.70)	5.27	(3.64	-	7.35)	0.94	(0.54	-	1.53)
New Hampshire	1.97	(1.52	-	2.51)	6.25	(4.19	-	8.94)	5.82	(4.08	-	8.01)	0.81	(0.45	-	1.35)
New Jersey	1.64	(1.24	-	2.13)	3.48	(2.35	-	4.94)	5.70	(3.99	-	7.85)	0.82	(0.45	-	1.39)
New Mexico	1.73	(1.31	-	2.24)	4.33	(2.86	-	6.28)	4.20	(2.88	-	5.89)	0.85	(0.47	-	1.42)
New York	1.93	(1.58	-	2.33)	3.34	(2.52	-	4.34)	6.89	(5.54	-	8.44)	0.96	(0.61	-	1.42)
North Carolina	1.55	(1.17	-	2.02)	3.05	(2.03	-	4.40)	5.02	(3.58	-	6.83)	0.81	(0.44	-	1.36)
North Dakota	1.49	(1.14	-	1.92)	3.64	(2.39	-	5.29)	4.09	(2.76	-	5.83)	0.66	(0.35	-	1.12)
Ohio	1.62	(1.33	-	1.94)	3.62	(2.80	-	4.60)	5.11	(4.09	-	6.28)	0.76	(0.48	-	1.13)
Oklahoma	1.58	(1.20	-	2.06)	3.31	(2.15	-	4.86)	4.81	(3.34	-	6.69)	0.76	(0.42	-	1.27)
Oregon	1.92	(1.42	-	2.54)	5.03	(3.46	-	7.04)	5.52	(3.87	-	7.61)	0.98	(0.50	-	1.72)
Pennsylvania	1.58	(1.32	-	1.88)	3.05	(2.33	-	3.93)	6.13	(4.94	-	7.49)	0.72	(0.47	-	1.07)
Rhode Island	1.70	(1.29	-	2.19)	4.08	(2.75	-	5.81)	5.58	(3.88	-	7.75)	0.82	(0.47	-	1.34)

South Carolina	1.54	(1.16	-	2.01)	4.11	(2.73	-	5.93)	4.48	(3.05	-	6.34)	0.73	(0.40	-	1.23)
South Dakota	1.49	(1.13	-	1.92)	3.79	(2.40	-	5.68)	4.27	(2.93	-	5.99)	0.60	(0.32	-	1.02)
Tennessee	1.69	(1.29	-	2.17)	4.76	(3.29	-	6.64)	5.10	(3.52	-	7.11)	0.74	(0.40	-	1.24)
Texas	1.79	(1.49	-	2.14)	4.72	(3.78	-	5.82)	4.50	(3.55	-	5.61)	0.78	(0.47	-	1.23)
Utah	2.11	(1.59	-	2.75)	3.38	(2.22	-	4.92)	4.91	(3.38	-	6.87)	1.06	(0.57	-	1.81)
Vermont	1.92	(1.48	-	2.44)	4.56	(2.98	-	6.65)	6.34	(4.62	-	8.46)	0.84	(0.48	-	1.38)
Virginia	1.55	(1.16	-	2.04)	3.54	(2.47	-	4.91)	4.37	(2.97	-	6.19)	0.86	(0.47	-	1.44)
Washington	1.97	(1.39	-	2.71)	4.39	(2.98	-	6.21)	4.37	(2.87	-	6.34)	1.26	(0.62	-	2.26)
West Virginia	1.47	(1.10	-	1.92)	3.96	(2.70	-	5.60)	4.58	(3.10	-	6.49)	0.69	(0.38	-	1.16)
Wisconsin	1.71	(1.34	-	2.15)	4.44	(3.13	-	6.11)	5.30	(3.75	-	7.25)	0.71	(0.39	-	1.17)
Wyoming	1.61	(1.22	-	2.10)	3.12	(1.94	-	4.75)	5.03	(3.48	-	7.00)	0.72	(0.39	-	1.22)

Note: Estimates are based on a survey-weighted hierarchical Bayes estimation approach, and the prediction (credible) intervals are generated by Markov Chain Monte Carlo techniques.

[1] This estimate is the sum of the hierarchical Bayes estimates across all States and the District of Columbia and typically is not equal to the direct sample-weighted estimate for the Nation.

Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.

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Table 9. Estimated Numbers of Persons Aged 12 or Older Needing But Not Receiving Treatment for an Illicit Drug Problem in the Past Year, by State: 2000

State	Total				Age Group (Years)											
					12-17				18-25				26 or Older			
	Estimate	Prediction Interval			Estimate	Prediction Interval			Estimate	Prediction Interval			Estimate	Prediction Interval		
Total[1]	3,994,321				963,682				1,511,823				1,518,816			
Alabama	60,846	(46,03	-	78,48	13,085	(8,602	-	19,04	26,845	(18,76	-	37,07	20,916	(11,53	-	34,96

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Alaska	10,381	(7,654	-	13,748)	2,879	(1,819	-	4,316)	3,451	(2,332	-	4,904)	4,051	(2,101	-	7,079)
Arizona	88,686	(61,861	-	122,928)	19,499	(13,259	-	27,571)	25,902	(18,035	-	35,909)	43,284	(21,685	-	77,124)
Arkansas	34,202	(26,365	-	43,209)	9,509	(6,605	-	13,217)	14,384	(10,201	-	19,640)	10,309	(5,505	-	17,675)
California	563,676	(461,420	-	681,354)	147,129	(122,173	-	175,448)	172,043	(137,555	-	212,195)	244,504	(158,079	-	361,194)
Colorado	71,131	(52,786	-	93,664)	16,164	(11,034	-	22,779)	24,240	(16,801	-	33,714)	30,727	(16,590	-	52,052)
Connecticut	52,010	(39,045	-	67,330)	13,550	(9,089	-	19,348)	20,130	(13,989	-	27,911)	18,329	(9,975	-	30,890)
Delaware	11,100	(8,216	-	14,555)	2,743	(1,910	-	3,807)	3,719	(2,539	-	5,241)	4,637	(2,513	-	7,823)
District of Columbia	8,820	(6,463	-	11,764)	1,852	(1,181	-	2,757)	2,820	(1,903	-	4,009)	4,148	(2,288	-	6,926)
Florida	196,128	(160,449	-	237,262)	47,578	(36,955	-	60,209)	71,294	(56,572	-	88,505)	77,256	(48,883	-	116,233)
Georgia	110,012	(83,253	-	141,784)	27,273	(19,260	-	37,405)	41,947	(29,324	-	57,986)	40,792	(22,069	-	69,160)
Hawaii	16,838	(11,247	-	24,197)	5,034	(3,235	-	7,439)	4,375	(2,823	-	6,453)	7,429	(3,144	-	14,895)
Idaho	19,700	(15,320	-	24,692)	5,408	(3,654	-	7,689)	9,029	(6,443	-	12,264)	5,263	(2,998	-	8,588)
Illinois	164,309	(134,517	-	198,622)	34,985	(27,164	-	44,296)	65,356	(52,140	-	80,766)	63,967	(41,229	-	94,762)
Indiana	82,093	(63,426	-	104,093)	19,227	(13,104	-	27,157)	35,911	(25,685	-	48,693)	26,955	(15,344	-	44,012)
Iowa	32,845	(24,272	-	43,409)	7,980	(5,092	-	11,892)	14,102	(9,375	-	20,312)	10,764	(5,795	-	18,339)
Kansas	35,310	(25,915	-	46,538)	7,244	(4,526	-	10,977)	13,406	(9,189	-	18,833)	14,661	(8,086	-	24,443)
Kentucky	53,647	(41,501	-	67,985)	13,165	(9,088	-	18,395)	22,798	(16,010	-	31,378)	17,684	(9,940	-	29,135)
Louisiana	65,208	(51,141	-	82,168)	16,667	(11,418	-	23,435)	28,934	(20,515	-	39,500)	19,607	(10,779	-	32,892)
Maine	18,817	(14,469	-	24,008)	5,463	(3,668	-	7,796)	7,565	(5,244	-	10,516)	5,789	(3,164	-	9,736)
Maryland	80,734	(59,889	-	106,368)	19,869	(13,686	-	27,791)	26,850	(18,617	-	37,333)	34,014	(17,947	-	58,740)
Massachusetts	108,669	(79,822	-	142,946)	28,215	(19,513	-	39,308)	36,641	(25,823	-	50,255)	43,812	(23,113	-	75,335)
Michigan	137,607	(115,803	-	162,255)	34,424	(27,201	-	42,911)	61,890	(49,773	-	75,909)	41,293	(26,205	-	62,041)
Minnesota	75,663	(56,40	-	98,35	18,474	(12,87	-	25,61	26,808	(18,63	-	37,23	30,382	(16,19	-	51,99

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Mississippi	37,181	(28,302	-	47,497)	8,488	(5,598	-	12,320)	16,533	(11,495	-	22,948)	12,160	(6,858	-	19,973)
Missouri	67,487	(50,268	-	88,011)	15,037	(9,666	-	22,287)	27,465	(18,862	-	38,532)	24,985	(13,270	-	42,967)
Montana	12,396	(9,491	-	15,863)	3,955	(2,599	-	5,745)	4,616	(3,207	-	6,415)	3,825	(2,080	-	6,462)
Nebraska	22,267	(16,953	-	28,303)	5,205	(3,390	-	7,627)	9,747	(6,885	-	13,352)	7,315	(3,948	-	12,421)
Nevada	27,941	(21,071	-	36,296)	6,816	(4,533	-	9,808)	9,672	(6,679	-	13,493)	11,453	(6,581	-	18,540)
New Hampshire	19,883	(15,317	-	25,333)	6,566	(4,397	-	9,381)	7,006	(4,918	-	9,640)	6,310	(3,487	-	10,532)
New Jersey	110,186	(83,020	-	143,273)	21,851	(14,783	-	31,061)	44,599	(31,248	-	61,478)	43,737	(23,831	-	73,748)
New Mexico	25,748	(19,531	-	33,350)	7,533	(4,968	-	10,914)	8,854	(6,078	-	12,426)	9,362	(5,161	-	15,649)
New York	285,054	(233,386	-	344,527)	49,307	(37,179	-	64,032)	125,708	(101,175	-	154,035)	110,039	(70,584	-	163,580)
North Carolina	98,671	(74,303	-	128,412)	19,877	(13,217	-	28,668)	39,033	(27,845	-	53,051)	39,762	(21,745	-	66,937)
North Dakota	8,019	(6,077	-	10,276)	2,259	(1,484	-	3,287)	3,162	(2,132	-	4,506)	2,598	(1,399	-	4,431)
Ohio	150,150	(123,896	-	180,234)	34,443	(26,622	-	43,776)	61,867	(49,588	-	76,133)	53,840	(34,325	-	80,494)
Oklahoma	43,449	(32,808	-	56,404)	10,098	(6,561	-	14,836)	17,632	(12,228	-	24,530)	15,719	(8,643	-	26,320)
Oregon	54,906	(40,135	-	71,855)	13,900	(9,562	-	19,455)	19,589	(13,730	-	26,996)	21,417	(10,890	-	37,856)
Pennsylvania	160,117	(133,536	-	190,349)	30,162	(22,965	-	38,851)	72,657	(58,589	-	88,901)	57,298	(37,093	-	84,635)
Rhode Island	13,983	(10,600	-	17,959)	3,417	(2,304	-	4,866)	5,282	(3,671	-	7,329)	5,284	(3,007	-	8,625)
South Carolina	48,469	(36,463	-	62,805)	13,398	(8,892	-	19,324)	17,298	(11,753	-	24,479)	17,773	(9,780	-	29,812)
South Dakota	9,262	(7,010	-	11,863)	2,784	(1,762	-	4,171)	3,739	(2,567	-	5,248)	2,739	(1,477	-	4,668)
Tennessee	78,992	(60,266	-	101,055)	22,063	(15,248	-	30,779)	30,487	(21,077	-	42,515)	26,442	(14,397	-	44,653)
Texas	287,765	(238,763	-	343,704)	88,677	(70,975	-	109,278)	106,489	(84,048	-	132,855)	92,599	(55,613	-	145,327)
Utah	36,474	(27,201	-	47,167)	8,360	(5,490	-	12,177)	15,995	(11,017	-	22,379)	12,120	(6,473	-	20,701)
Vermont	9,810	(7,568	-	12,500)	2,511	(1,642	-	3,663)	3,980	(2,901	-	5,308)	3,320	(1,873	-	5,454)

Virginia	87,768	(65,335	-	115,360)	19,913	(13,884	-	27,610)	30,225	(20,550	-	42,761)	37,630	(20,613	-	63,304)
Washington	94,245	(66,323	-	129,778)	21,368	(14,517	-	30,240)	26,444	(17,403	-	38,417)	46,433	(23,048	-	83,569)
West Virginia	22,959	(17,142	-	29,879)	5,606	(3,816	-	7,922)	8,916	(6,041	-	12,647)	8,437	(4,621	-	14,135)
Wisconsin	75,832	(58,708	-	94,080)	21,142	(14,876	-	29,077)	31,298	(22,167	-	42,778)	23,392	(13,046	-	38,865)
Wyoming	6,872	(5,174	-	8,915)	1,531	(951	-	2,331)	3,089	(2,139	-	4,303)	2,252	(1,216	-	3,830)

Note: Estimates are based on a survey-weighted hierarchical Bayes estimation approach, and the prediction (credible) intervals are generated by Markov Chain Monte Carlo techniques.

[1] This estimate is the sum of the hierarchical Bayes estimates across all States and the District of Columbia and typically is not equal to the direct sample-weighted estimate for the Nation.

Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.

Chapter 3: End Notes

[1] States were ranked from lowest to highest based on the percentage gap to two decimals. Nine States were included in the third (middle) "fifth." Also see Figure 4 for the comparable numbers of persons.

[2] This is the national sample weighted estimate. Also, shown in Tables 8 and 9 are the corresponding "Totals" that represent the weighted average across States of the model-based estimates. The "Totals" are similar, but not identical, to the corresponding sample weighted national estimates.

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Appendices

Appendix A: Measurement of Dependence, Abuse, Treatment, and Treatment Need

The National Household Survey on Drug Abuse (NHSDA) has been used for many years to measure problematic substance use, including the need for and receipt of treatment. Different methods and definitions have been used, based on the particular focus of each analysis undertaken. This report presents estimates of the treatment gap and the need for and receipt of treatment for an illicit drug problem. Prior NHSDA reports and special analyses have included estimates of these measures. However, due to significant changes to the NHSDA questionnaire and the definitions and estimation methods used, the estimates of these measures from the 2000 NHSDA are not comparable with prior estimates. This appendix describes the changes and their impact on estimates.

A.1 Dependence

Since 1991, the NHSDA has included questions to estimate dependence. The questions have been based on criteria established by the American Psychiatric Association (APA) in its *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III-R, DSM-IV; APA, 1987, 1994). Questions in the 1991 to 1993 NHSDAs were based on the DSM-III-R definition of dependence, and questions in the 1994 to 2000 NHSDAs were based on the DSM-IV definition of dependence. DSM-IV defines a person as dependent if he or she met three out of seven dependence criteria (for substances with a withdrawal criterion) or three out of six criteria (for substances without a withdrawal criterion).

As part of an ongoing process to evaluate and improve the questions in the NHSDA, questions that were used in 1999 were cognitively tested to determine how well they were understood by respondents and to determine whether any particular phrases or words were problematic. The questions were also reviewed by an expert in the field to determine how well the questions captured the meaning of the DSM-IV criteria. Based on these assessments, the questions were revised for the 2000 NHSDA. Some individual questions were divided into several less complex questions, and revisions were made to improve question wording. Table A.1 at the end of this appendix indicates the questions used in 1999 and the revised questions used in 2000 to measure each DSM-IV criterion for each substance.

The revised dependence questions are generally more restrictive and less global than the ones used in 1999. Prevalence estimates for each criterion by substance are given in Table A.2 for the 1999 and 2000 NHSDAs. For most criteria, the 2000 estimate is smaller than the 1999estimate. This is probably due to the more restrictive nature of the questions covering the criteria in 2000. For example, criterion 3 was previously covered by a question asking whether the drug was used much more often or in larger amounts than intended. In 2000, criterion 3 was covered by two questions, one asking whether limits were set on the use of the substance and another asking if the limits were kept. To meet the criterion, a person must have a positive response to the first question and a negative response to the second question. For marijuana, the estimate for criterion 3 was 0.4 percent in 2000 and 1.4 percent in 1999.

The generally lower prevalences in 2000 for individual criteria resulted in a lower estimated prevalence for dependence. Estimates of dependence for 1999 and 2000 for any illicit drug and by specific substances (illicit drugs and alcohol) are given in Table A.3. Estimates of dependence for 1999 and 2000 for any illicit drug and for alcohol by demographic subgroups are given in Table A.4. The estimated percentage of persons aged 12 or older dependent on any illicit drug was 23 percent smaller in 2000 than in 1999 (1.6 percent in 1999 vs. 1.2 percent in 2000). The estimated percentage of persons dependent on alcohol was 38 percent smaller in 2000 than in 1999 (3.7 percent in 1999 vs. 2.3 percent in 2000). Estimates of dependence for any illicit drug were generally smaller in 2000 than in 1999 by most demographic subgroups. Although estimates of dependence were smaller in 2000 than in 1999, they followed similar patterns by demographic subgroups.

Estimates of dependence by State for 1999 are based on the 1999 dependence questions and not the revised dependence questions used in 2000. Thus, these dependence estimates are not comparable with estimates of dependence by State in 2000.

A.2 Abuse

In 2000, questions to measure abuse based on the DSM-IV were introduced into the NHSDA for the first time. These questions were designed to cover the four abuse criteria defined in the DSM-IV. Table A.1 indicates the abuse questions in the 2000 NHSDA used to cover each abuse criterion. According to the DSM-IV, a person is defined with abuse if he or she meets one or more of the abuse criteria and does not meet the definition for dependence. The questions on abuse were cognitively tested and reviewed by experts in the field. Estimates of abuse are given in Table A.3 for individual substances and in Table A.4 by demographic characteristics. Estimates of abuse were smaller than estimates of dependence for any illicit drug and for specific illicit drugs. However, for alcohol the estimated percentage with abuse (3.1 percent) was larger than the estimated percentage with dependence (2.3 percent) in 2000.

A.3 Illicit Drug Treatment Need and Gap

In recent years, the Substance Abuse and Mental Health Services Administration (SAMHSA) produced estimates of illicit drug treatment need and the treatment gap (i.e., persons who needed but did not receive treatment) using two basic methods: adjusted and unadjusted. The adjusted estimates incorporated a ratio adjustment technique that inflated the NHSDA numbers based on separate counts of treatment and arrestee populations (Wright, Gfroerer, & Epstein, 1997). These ratio-adjusted treatment need and gap estimates were made only at the national level and were used by the Office of National Drug Control Policy (ONDCP) in its annual national drug control strategy. Unadjusted treatment need and gap estimates were used in most analyses of NHSDA data, including several SAMHSA publications. Although both the adjusted and unadjusted estimates employed the same definitions of need, the ratio adjustment produces estimates that are 20 to 30 percent higher than the unadjusted estimates. Starting with the 2000 NHSDA, a single new method for estimating treatment need and the gap has been employed. This new method was developed by an interagency work group chaired by ONDCP. The method uses a simpler and more widely accepted definition of treatment need than had been used previously, and it does not employ the ratio adjustment. There are two reasons that the ratio adjustment is no longer used: (a) to provide more accurate trend measurement, and (b) to allow the possibility of subgroup analysis. The ratio adjustment methodology is problematic because it depends on external data that are not available with the consistency over time or by geographic and demographic subpopulations.

The following discussion explains the change in the methodology for estimating treatment need and the gap and how the change affects the resulting estimates.

A.3.1 Definitions of Treatment Need

For the 1991 to 1999 NHSDAs, a respondent was classified as needing treatment (total treatment need) if he or she met at least one of four criteria during the past year: (1) dependent on any illicit drug; (2) used marijuana daily, or used some other illicit drug on at least 52 days; (3) was an injection drug user or used heroin at least once; and/or (4) received any treatment for drug abuse. Respondents needing treatment were further classified into "level 1" and "level 2" treatment need. Respondents needing treatment for a more severe drug problem were defined

with level 2 treatment need. Respondents classified with needing treatment who did not meet the definition for level 2 treatment need were defined with level 1 treatment need. Respondents classified with level 2 drug abuse treatment need met at least one of the following five criteria in the past year: (1) dependent on any illicit drug other than marijuana; (2) used marijuana daily and were dependent on marijuana; (3) used cocaine on 52 or more days, or used some other illicitdrug daily; (4) were injection drug users or used heroin at least once; and/or (5) received treatment for drug abuse at a specialty facility (hospital [as an inpatient], mental health center, or drug treatment facility). Level 2 treatment need and specialty treatment are the measures used in calculating the "treatment gap" for the 1991 through 1999 NHSDAs (Office of Applied Studies [OAS], 1998).

The new definition of treatment need for 2000 classifies a respondent as needing treatment if he or she meets the criteria for dependence or abuse (DSM-IV) or received treatment at a specialty facility. Plans are to continue using this revised definition of treatment need in future years.

A.3.2 Comparison of Old Ratio-Adjusted Estimates with New Estimates

It is difficult to compare estimates of treatment need and the "treatment gap" used by ONDCP prior to 1999 with the new estimates for 2000 because several important changes to the NHSDA in 1999 and 2000 affected the estimates. Between 1998 and 1999, the NHSDA switched from a paper-and-pencil-interviewing (PAPI) mode to a computer-assisted interviewing (CAI) mode. All questions on drug use, dependence, and treatment need were administered using audio computer-assisted self-interviewing (ACASI) in 2000. There were also major changes to the sample design. The revision of the dependence questions in 2000 also affected the treatment need estimate. Besides these changes to the NHSDA, the change in the definition of treatment need in 2000 and the ratio adjustment used previously have had a significant impact on the estimates. As discussed below, estimates using the old definition (level 2) of treatment need on the 2000 file were 45 percent lower than estimates using the 2000 definition on the 2000 file. The ratio adjustment increased the old estimates by 20 to 30 percent, but it is not included in the new estimates of treatment need in 2000.

Table A.5 compares the old ratio-adjusted estimates of illicit drug treatment need and gap from 1991 to 1998 with the new estimates for 2000. The estimated numbers who needed treatment ranged from 4.6 million to 5.7 million from 1991 to 1998. The estimate for 2000 using the new methodology was 4.7 million. Although the new estimate is similar in size to the old estimates, this does not necessarily reflect stability in the numbers of persons in the population who need treatment. The methods upon which these estimates are based are quite different, as explained earlier. Furthermore, the estimated numbers of persons who received treatment were very different with the new and old methods. These estimates ranged from 1.6 million to 2.1 million from 1991 to 1998 and 0.8 million in 2000 using the new method. This probably reflects the fact that the 1991 to 1998 estimates incorporated the ratio adjustment, which essentially replaced the estimated numbers receiving treatment from the NHSDA (based on respondents' self-report) with an independent count of the numbers receiving treatment. The independent count used in this ratio adjustment was derived from a variety of sources, primarily the Uniform Facility Data Set (UFDS). The estimated treatment gap, which ranged from 2.5 million to 3.6 million for the 1991 to 1998 estimates, was somewhat higher with the new estimate for 2000 (3.9 million). Again,

due to the major changes in estimation methodology, the data do not indicate any real increase in the treatment gap. The higher gap number is simply the result of the change in methodology. Furthermore, the difference in gap estimates is likely due more to the change in the definition of treatment need than it is to the change in the way treatment is estimated. This is because the ratio adjustment previously used inflates the treatment need estimate at least as much as it inflates the treatment estimate because the treatment need estimates (both old and new) include treated persons by definition.

To gain insight into the effects of the various changes, it is helpful to analyze estimates from the old and new definitions without the ratio adjustment. Some analyses are discussed below.

A.3.3 Comparison of Old Unadjusted Estimates with New Estimates

Estimates of total treatment need and level 2 treatment need that do not include the ratio adjustment for 1999 are compared with estimates of treatment need for 2000 in Table A.6 by demographic subgroups. The 2000 estimates of treatment need were generally larger than the 1999 estimates of level 2 treatment need and smaller than the 1999 estimates of total treatment need by demographic subgroups. The estimated percentage of the population needing treatment in 2000 (2.1 percent) was smaller than the estimated percentage of the population with total treatment need in 1999 (3.5 percent) and larger than the estimated percentage of the population with level 2 treatment need in 1999 without a ratio adjustment (1.5 percent). It is impossible to determine how much of the difference between the 1999 and 2000 estimates is due to a real change in the population needing treatment and how much is due to the change in the definitions.

To analyze the impact of the change in the treatment need definition, estimates were run based on both definitions using the same data file. Specifically, using the 2000 NHSDA file, estimates of treatment need were calculated using the 1999 definition (level 2) (and 2000 dependence questions) and compared with estimates of treatment need calculated using the 2000 definition on the same file. With the 1999 definition, 1.2 percent of the population needed treatment (2.7 million persons), while with the 2000 definition, 2.1 percent of the population needed treatment (4.7 million persons). Estimates by demographic subgroups are given in Table A.7. Estimates of treatment need with the 2000 definition were larger than estimates of treatment need with the 1999 (level 2) definition overall and for each demographic subgroup, indicating that the change in definition between 1999 and 2000 resulted in an increase in the estimates of treatment need.

The estimate of level 2 treatment need using the 1999 definition on the 2000 NHSDA file (1.2 percent) was slightly smaller than the estimate of treatment need using the same definition on the 1999 NHSDA file (1.5 percent), indicating that there was probably little change in the numbers of people needing treatment between 1999 and 2000. The slight decrease in the estimate on the 2000 file could be due to the fact that the dependence questions in 2000 were more restrictive, resulting in smaller estimates of dependence.

To compare the new and old definitions of treatment need in their coverage of various populations of drug users, several populations with various patterns and symptoms indicative of a drug use problem were identified. The proportions in each population who would be classified as needing treatment were compared under the old and new definitions. Table A.8 indicates for

each of these populations the percentage of the population classified with level 2 treatment need using the 1999 definition, the percentage classified with treatment need using the 2000 definition, the percentage classified with dependence, and the percentage classified with abuse. Some of these populations were completely covered by level 2 treatment need because they were part of the definition of level 2 treatment need. This was true for heroin users, injection drug users, and weekly cocaine users. For these populations, the interest was in how well they would be covered by the new definition of treatment need and what proportion would be covered by abuse and dependence. More than 80 percent of the heroin users and the injection drug users were covered by the new definition of treatment need. Approximately 59 percent of weekly cocaine users were covered by the new definition of treatment need.

For some populations, the proportions covered by the old and new definitions of treatment need were not substantially different from each other. This was the case for weekly illicit drug users and daily marijuana users. The percentage classified with treatment need under the old definition among persons using an illicit drug weekly or more often was 41.2 percent, and the percentage classified as needing treatment under the new definition was 39.1 percent. Among daily marijuana users, 34.6 percent were classified as needing treatment under the old definition, and 35.6 percent were classified as needing treatment under the new definition.

Also compared were the percentages of persons meeting the old and new definitions of treatment need among each other. Among those who met the new definition of treatment need, 46.4 percent also met the old (level 2) definition of treatment need. Among those who met the old (level 2) definition of treatment need, 80.7 percent also met the new definition of treatmentneed. The estimated percentage of persons in the population meeting both the old and new definitions of treatment need was 0.9 percent.

A.3.4 Specialty Treatment

Persons who received specialty treatment in the past year but did not meet the criteria for dependence or abuse were included in the definition of treatment need because it was assumed that if a person received treatment, he or she probably needed it at some point in the past year. Keeping these people in the definition of treatment need does not affect the estimate of the number of people in the "treatment gap" because these people are included in the estimate of treatment need and the estimate of receiving treatment. Among the persons who received specialty treatment in the past year but did not meet the criteria for dependence or abuse, 53.2 percent were still in some kind of treatment at the time of interview, 27.9 percent had successfully completed treatment, 28.1 were arrested and booked in the past year, and 41.1 percent were on probation, parole, or other conditional release at some time in the past year.

In both 1999 and 2000, persons were defined as receiving specialty treatment if they received treatment in the past year at a hospital (as an inpatient), a mental health center, or a drug treatment facility. However, in the 2000 NHSDA, there were some changes from 1999 in the manner in which people were asked about treatment at specific locations. These changes resulted in a difference in the way specialty treatment was tabulated. In 1999, when a person was asked about treatment at a specific location, he or she was not asked whether the treatment was for alcohol or drugs. Thus, if a person reported receiving treatment for alcohol and drugs in the past

year, it was assumed that he or she received treatment for alcohol and drugs at each location that he or she reported receiving treatment.

Because at a specific location a person may only receive treatment for alcohol or only receive treatment for drugs, a question was added to determine whether the treatment received at a specific location was for alcohol only, drugs only, or both. In 2000, if a person reported receiving treatment for alcohol and drugs in the past year, and reported specific locations where he or she received treatment, the person was further asked for each location reported whether the treatment at that location was for alcohol, drugs, or both. As a result, some people who might have been counted as receiving specialty treatment for illicit drugs in 1999 would not be counted in 2000. An estimated 0.8 million persons (0.3 percent of the population) received specialty treatment for illicit drugs in 2000. If the estimate for 2000 had been tabulated in the same manner as in 1999, the estimate of the numbers of persons receiving specialty treatment for illicit drugs would be 0.9 million persons (0.4 percent of the population).

Table A.1 Questions in the 1999 NHSDA and Corresponding Questions in the 2000 NHSDA for Each DSM-IV Criterion for Dependence and Abuse

DSM Criterion	Questions in the 1999 NHSDA Used to Cover the DSM-IV Criteria	Questions in the 2000 NHSDA Used to Cover the DSM-IV Criteria
	Dependence	
1.	During the past 12 months, have you built up a tolerance for the drug so that the same amount of the drug had less effect than before?	During the past 12 months, did you need to use more of the drug than you used to in order to get the effect you wanted? During the past 12 months, did you notice that using the same amount of the drug had less effect on you than it used to?
2.	For cigarettes, alcohol, heroin, analgesics, sedatives, stimulants: (For cocaine or crack only: During the past 12 months, have you felt kind of blue or down when the effect of the drug you were using was wearing off?) During the past 12 months, have you had any of these symptoms as the effect of the drug was wearing off? Symptoms vary by drug (see next page)	Only for cigarettes, alcohol, cocaine, heroin, analgesics, sedatives, stimulants: During the past 12 months did you cut down or stop using the drug at least one time? (For cocaine or crack only: During the past 12 months, have you felt kind of blue or down when you cut down or stopped using the drug? During the past 12 months, did you have __ or more of these symptoms after you cut back or stopped using the drug? The

	During the past 12 months, did you use more of that drug to get over or avoid the bad aftereffects of using that drug?	symptoms and number needed to meet this criteria varies by drug. (See next page)
3.	During the past 12 months, have you used that kind of drug much more often or in larger amounts than you intended to?	During the past 12 months, did you try to set limits on how often or how much of the drug you would use? If above was answered yes: Were you able to keep to the limits you set or did you often use more than you intended to?
4.	During the past 12 months, did you want to try to stop or cut down on your use of that drug but found you couldn't?	During the past 12 months, did you want to or try to cut down or stop using the drug? During the past 12 months, were you able to cut down or stop using the drug every time you wanted to or tried to?
5.	During the past 12 months, did you have a period of a month or more when you spent a great deal of time getting the drug, using the drug, or getting over its effects?	During the past 12 months, was there a month or more when you spent a lot of your time getting or using the drug? During the past 12 months, was there a month or more when you spent a lot of your time getting over the effects of the drug?
6.	During the past 12 months, has your use of that drug often kept you from working, going to school, taking care of children, or engaging in recreational activities?	This question is about important activities such as working, going to school, taking care of children, doing fun things such as hobbies and sports, and spending time with friends and family. During the past 12 months, did using the drug cause you to give up or spend less time doing these types of important activities?
7.	a. During the past 12 months, has your use of the drug caused you any health problems? b. During the past 12 months, has your use of the drug caused you to have any emotional or psychological problems such as feeling uninterested in things, feeling depressed, feeling suspicious of people, feeling paranoid, or having	During the past 12 months, did you have any problems with your emotions, nerves or mental health that were probably caused or made worse by your use of the drug? Did you continue to use the drug even though you thought it was causing you to have problems with your emotions, nerves or mental health?

	strange ideas?	During the past 12 months, did you have any physical health problems that were probably caused or made worse by your use of the drug? Did you continue to use the drug even though you thought it was causing you to have physical problems?
	Abuse	
1.	Not asked in 1999 NHSDA.	Sometimes people who use this drug have serious problems at home, work or school—such as: -neglecting their children -missing work or school -doing a poor job at work or school -losing a job or dropping out of school During the past 12 months, did using this drug cause you to have serious problems like this either at work, school or home?
2.	Not asked in 1999 NHSDA.	During the past 12 months did you regularly use the drug and then do something where using the drug might have put you in physical harm?
3.	Not asked in 1999 NHSDA.	During the past 12 months, did using the drug cause you to do things that repeatedly got you in trouble with the law?
4.	Not asked in 1999 NHSDA.	During the past 12 months, did you have any problems with family or friends that were probably caused by your use of the drug ? Did you continue to use the drug even though you thought it caused problems with family or friends?
Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 1999 and 2000.		

Table A.2 Percentages Reporting Having Met DSM-IV Criteria, by Specific Substances: 1999 and 2000

Substance	**DSM-IV Criteria**

	Criterion 1		Criterion 2		Criterion 3		Criterion 4		Criterion 5		Criterion 6		Criterion 7	
	1999	2000	1999	2000	1999	2000	1999	2000	1999	2000	1999	2000	1999	2000
Marijuana	0.8	1.5	--	--	1.4	0.4	1.6	0.4	1.5	2.2	0.5	0.6	1.1	0.6
Cocaine	0.3	0.3	0.4	0.1	0.4	0.1	0.3	0.1	0.4	0.3	0.2	0.2	0.4	0.2
Heroin	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1
Hallucinogens	0.1	0.2	--	--	0.1	0.0	0.1	0.0	0.2	0.2	0.1	0.1	0.2	0.1
Inhalants	0.1	0.1	--	--	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0
Pain Relievers	0.1	0.4	0.2	0.2	0.3	0.1	0.2	0.1	0.3	0.4	0.2	0.2	0.2	0.1
Tranquilizers	0.1	0.2	--	--	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1
Stimulants	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Sedatives	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Alcohol	3.0	6.5	3.4	1.1	7.2	1.6	6.2	1.6	4.4	6.4	1.5	1.9	2.9	1.9

-- Not available.

NOTE: *Criterion 1*: Needed to use substance more than before to get desired effects or noticed that the same amount of substance use had less effect than before. *Criterion 2*: Reported experiencing two or more additional substance withdrawal symptoms at the same time that lasted longer than a day after substance use was cut back or stopped. Also, for cocaine and stimulants, respondent must have reported feeling blue or down when trying to stop or cut down using substance (not a necessary criterion for dependence of marijuana, hallucinogens, inhalants, or tranquilizers). *Criterion 3*: Used substance more often than intended and was unable to keep set limits on substance use. *Criterion 4*: Inability to cut down or stop using substance every time tried or wanted to. *Criterion 5*: Spent a great deal of time over a period of a month getting, using, or getting over the effects of substance. *Criterion 6*: Substance use reduced or eliminated involvement or participation in important activities. *Criterion 7*: Continued to use substance even though it was causing problems with emotions, nerves, mental health, or physical problems.

Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 1999 and 2000.

Table A.3 Total Population and Percentages of Persons Aged 12 or Older Classified with Dependence on Specific Substances in 1999 and 2000 and Classified with Abuse of Specific Substances in 2000

	Dependence 1999		Dependence 2000		Abuse 2000	
Substance	**Number (in Thousands)**	**Percent**	**Number (in Thousands)**	**Percent**	**Number (in Thousands)**	**Percent**
Any Illicit Drug[1]	3,554	1.6	2,771	1.2	1,538	0.7
Marijuana	2,319	1.0	1,676	0.8	1,164	0.5
Cocaine	770	0.3	557	0.2	190	0.1
Heroin	141	0.1	164	0.1	20	0.0
Hallucinogens	256	0.1	151	0.1	251	0.1
Inhalants	103	0.0	101	0.0	77	0.0
Any Psychotherapeutic	718	0.3	698	0.3	386	0.2
Pain Reliever	447	0.2	443	0.2	279	0.1
Tranquilizers	148	0.1	149	0.1	115	0.1
Stimulants	278	0.1	238	0.1	83	0.0
Sedatives	86	0.0	81	0.0	39	0.0
Alcohol	8,201	3.7	5,089	2.3	7,021	3.1

NOTE: Dependence and abuse are based on the definition found in the 4th edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) (APA, 1994).

[1]Any Illicit Drug includes marijuana/hashish, cocaine (including crack), heroin, hallucinogens (including LSD and PCP), inhalants, or any prescription-type psychotherapeutic used nonmedically.

Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 1999 and 2000.

Table A.4 Percentages of Persons Aged 12 or Older Reporting Past Year Illicit Drug or Alcohol Dependence, by Demographic Characteristics: 1999 and 2000

	Type of Past Year Dependence				Type of Past Year Abuse	
	Any Illicit Drug		Alcohol		Any Illicit Drug	Alcohol
Demographic Characteristic	**1999**	**2000**	**1999**	**2000**	**2000**	**2000**
Total	1.6	1.2	3.7	2.3	0.7	3.1
Age in Years						
12-17	3.3	2.4	3.6	1.8	2.0	3.3
18-25	4.7	3.5	9.2	4.6	2.0	8.1
26 or older	0.9	0.7	2.8	2.0	0.3	2.3
Gender						

Male	2.0	1.5	4.9	3.1	0.9	4.5
Female	1.3	1.0	2.6	1.5	0.5	1.9
Hispanic Origin and Race						
Not Hispanic						
White only	1.5	1.2	3.8	2.2	0.6	3.3
Black only	2.3	1.6	3.1	2.4	0.7	2.2
American Indian or Alaska Native only	4.7	1.6	5.1	3.4	2.5	4.4
Native Hawaiian or other Pacific Islander	*	1.4	*	1.3	0.1	1.5
Asian only	0.8	0.5	2.2	2.0	0.3	1.3
More than one race	2.6	2.5	7.7	2.8	*	3.6
Hispanic	1.9	1.2	3.9	2.4	1.1	3.5

*Low precision; no estimate reported.

NOTE: Dependence is based on the definition found in the 4th ed. of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) (APA, 1994).

Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 1999 and 2000.

Table A.5 Treatment Gap for Persons Aged 12 or Older: 1991 to 1998 and 2000

	Old Method								New Method[1]
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**2000**
Needs Treatment (in Thousands)	5,148	4,716	4,741	4,610	4,646	5,303	5,726	5,031	4,655
Received Treatment (in Thousands)	1,649	1,814	1,848	1,984	2,121	1,973	2,137	2,137	774
% Treated[2]	32%	38%	39%	43%	46%	37%	37%	43%	16.6%
% Not Treated[2]	68%	62%	61%	57%	54%	63%	63%	57%	83.4%
Treatment Gap (in Thousands)	3,499	2,904	2,893	2,626	2,525	3,330	3,589	2,894	3,881

NOTE: Because of changes in the NHSDA and in the methodology, no treatment gap numbers are included for 1999. The "treatment gap" consists of those persons who needed treatment for an illicit drug problem but did not receive treatment. "Needs treatment" refers to level 2 treatment need. "Received treatment" refers to treatment received for drug abuse at a specialty facility (hospital [as an inpatient], mental health center, or drug treatment facility).

[1] Corresponds to the 2000 definition of "treatment need," not the definition of level 2 treatment need.
[2] "% treated" and the "% not treated" are among those persons who need treatment in the past year.

Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 1991-1998 and 2000.

Table A.6 Comparison of Treatment Need Estimates from the 1999 and 2000 NHSDAs for Percentages of Persons Aged 12 or Older

	1999 NHSDA (Without Ratio Adjustment)		2000 NHSDA
Demographic Characteristic	**Total Treatment Need[1]**	**Level 2 Treatment Need[1]**	**Treatment Need[2]**
Total	3.5	1.5	2.1
Age in Years			
12-17	6.6	2.1	4.6
18-25	8.5	3.5	5.7
26 or older	2.2	1.1	1.1
Gender			
Male	4.4	2.0	2.6
Female	2.6	1.1	1.6
Hispanic Origin and Race			
Not Hispanic			
White only	3.1	1.4	2.0
Black only	4.9	2.1	2.5
American Indian or Alaska Native only	9.2	3.9	4.3
Native Hawaiian or other Pacific Islander	0.8	*	1.8

Asian only	2.2	0.5	0.7
More than one race	6.3	3.0	5.5
Hispanic	4.2	1.8	2.4

*Low precision; no estimate reported.

[1] Respondents were classified as needing treatment for illicit drug abuse if they met at least one of four criteria during the past year: (1) dependent on any illicit drug; (2) used marijuana daily, or used some other illicit drug on at least 52 days; (3) were injection drug users or used heroin; or (4) received any treatment for drug abuse. Respondents were classified with level 2 drug abuse treatment need if they met at least one of the following five criteria in the past year: (1) used marijuana daily and were dependent on marijuana; (2) were dependent on an illicit drug other than marijuana; (3) used cocaine on 52 or more days, or used inhalants, hallucinogens, pain relievers, tranquilizers, sedatives, or stimulants daily; (4) were injection drug users or used heroin; or (5) received treatment for drug abuse at a specialty facility (i.e., a hospital as an inpatient, a mental health center, or a drug abuse facility).
[2] For the 2000 definition of "needing treatment," respondents were classified as needing treatment for illicit drug abuse if they met at least one of three criteria during the past year: (1) dependent on any illicit drug; (2) abuse of any illicit drug; or (3) received treatment for drug abuse at a specialty facility (i.e., drug and alcohol rehabilitation facilities [inpatient or outpatient], hospitals [inpatient only], and mental health centers).

Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 1999 and 2000.

Table A.7 Comparison of Treatment Need Estimates Using the 1999 Definition of Level 2 Treatment Need and the 2000 Definition of Treatment Need on the 2000 NHSDA's Estimated Numbers of Persons Aged 12 or Older

	1999 Definition of Treatment Need (Level 2)[1]		**2000 Definition of Treatment Need[2]**	
Demographic Characteristic	**Number (in Thousands)**	**Percent**	**Number (in Thousands)**	**Percent**
Total	2,677	1.2	4,655	2.1
Age in Years				
12-17	424	1.8	1,074	4.6
18-25	769	2.7	1,645	5.7
26-34	504	1.5	730	2.2
35 or older	981	0.7	1,207	0.9
Gender				
Male	1,554	1.4	2,749	2.6
Female	1,123	1.0	1,907	1.6
Hispanic Origin and Race				
Not Hispanic				

White only	1,907	1.2	3,235	2.0
Black only	353	1.4	632	2.5
American Indian or Alaska Native only	37	3.4	46	4.3
Native Hawaiian or other Pacific Islander	10	1.8	10	1.8
Asian only	28	0.4	54	0.7
More than one race	43	2.3	103	5.5
Hispanic	299	1.3	574	2.4

[1] Respondents were classified with level 2 drug abuse treatment need if they met at least one of the following five criteria in the past year: (1) used marijuana daily and were dependent on marijuana; (2) were dependent on an illicit drug other than marijuana; (3) used cocaine on 52 or more days, or used inhalants, hallucinogens, pain relievers, tranquilizers, sedatives, or stimulants daily; (4) were injection drug users or used heroin; or (5) received treatment for drug abuse at a specialty facility (i.e., a hospital as an inpatient, a mental health center, or a drug abuse facility).

[2] For the 2000 Definition of "needing treatment," respondents were classified as needing treatment for illicit drug abuse if they met at least one of three criteria during the past year: (1) dependent on any illicit drug; (2) abuse of any illicit drug; or (3) received treatment for drug abuse at a specialty facility (i.e., drug and alcohol rehabilitation facilities [inpatient or outpatient], hospitals [inpatient only], and mental health centers).

Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.

Table A.8 Percentages Reporting Needing Treatment (1999 Definition - Level 2), Needing Treatment (2000 Definition), Abuse Only, and Dependence Only for Any Illicit Drug in the Past Year among Persons Aged 12 or Older: 2000

		Treatment Need			
Drug Use-Related Activities	**Size of Population (in Thousands)**	**1999 Definition (Level 2)**	**2000 Definition**	**Abuse Only (2000)**	**Dependence Only**
Used an illicit drug weekly or more often	3,644	41.2	39.1	9.6	28.3
Used heroin at least once	308	100.0	80.4	6.9	68.6
Used a needle to inject heroin, cocaine or stimulants	322	100.0	81.4	3.2	77.6
Used marijuana daily	998	34.6	35.6	9.2	26.0
Used cocaine weekly or more often	792	100.0	58.5	8.9	48.8
Met two or more DSM-IV dependence criteria	6,903	28.1	52.4	12.5	39.0

Used cocaine weekly with two or more dependence criteria	525	100.0	84.0	10.1	73.6
Had treatment for a drug problem at a hospital, treatment center, or mental health center	774	100.0	100.0	9.5	45.7
Had any type of treatment	1,268	67.2	73.0	9.5	36.2
Used inhalants weekly	354	36.7	50.5	12.3	37.7
Used psychotherapeutic weekly	2,642	31.9	37.0	10.2	25.6
With dependence or abuse	4,308	42.1	100.0	35.7	64.3
1999 definition (level 2)	2,677	100.0	80.7	5.9	61.8
NOTE: Dependence is based on the definition found in the 4th ed. of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) (APA, 1994).					
Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.					

Appendix B: State Estimation Methodology

B.1 Background

In response to the need for State-level information on substance abuse problems, the Substance Abuse and Mental Health Services Administration (SAMHSA) began developing and testing small area estimation (SAE) methods for the National Household Survey on Drug Abuse (NHSDA) in 1994 under a contract with RTI of Research Triangle Park, North Carolina. That developmental work used logistic regression models with data from the combined 1991 to 1993 NHSDAs and local area indicators, such as drug-related arrests, alcohol-related death rates, and block group/tract-level characteristics from the 1990 Census that were found to be associated with substance abuse. In 1996, the results were published for 25 States for which there were sufficient sample data (Office of Applied Studies [OAS], 1996). A subsequent report described the methodology in detail and noted areas in which improvements were needed (Folsom & Judkins, 1997).

The increasing need for State-level estimates of substance use led to the decision to expand the NHSDA to provide estimates for all 50 States and the District of Columbia on an annual basis beginning in 1999. It was determined that, with the use of modeling similar to that used with the 1991 to 1993 NHSDA data in conjunction with a sample designed for State-level estimation, a sample of about 67,500 persons would be sufficient to make reasonably precise estimates.

The State-based NHSDA sample design implemented in 1999 had the following characteristics:

- States are stratified into field interviewer (FI) regions that covered the geography of each State. The FI regions are comprised of contiguous Census tracts and counties and designed to yield about 75 interviews per region. In the 42 smaller States (by population)

and the District of Columbia, there are 12 FI regions; in the eight largest States, there are 48 FI regions.
- Within each region, eight segments are randomly selected and two are allocated to each calendar quarter of data collection.
- Within each segment, households are screened, and a sample of one to two persons per household is selected. An average of nine responding persons per segment is sought.
- The samples are selected so that approximately 900 responding persons, 300 in each age group (12 to 17, 18 to 25, and 26 or older), are drawn in each of the 42 States and the District of Columbia. In the eight large States, the person samples are allocated equally to the three age groups with overall respondent sample sizes ranging from 2,669 to 4,681.
- Tables B.1, B.2, and B.3 present, respectively, the achieved response rates, the survey population sizes (by State and age group), and the associated samples sizes.

In preparation for the modeling of the 1999 data, RTI used the data from the combined 1994-96 NHSDAs to develop an improved methodology that utilized more local area data and produced better estimates of the accuracy of the State estimates (Folsom, Shah, & Vaish, 1999). That effort involved the development of procedures that would validate the results for geographic areas with large samples. This work was reviewed by a panel with expertise in small area estimation.[3] They approved of the methodology, but suggested further improvements for the modeling to be used to produce the 1999 State estimates. Those improvements have been incorporated into the methodology finally used for the State estimates included in this report. The methodology, called Survey-Weighted Hierarchical Bayes Estimation (HB), is described below.

B.2 Goals of Modeling

There were several goals underlying the estimation process. The first was to model substance use-related rates at the lowest possible level and aggregate over the levels to form the State estimates. The chosen level of aggregation was the 32 age group (12 to 17, 18 to 25, 26 to 34, 35+) by race/ethnicity (white-not Hispanic, black-not Hispanic, Hispanic, other) by gender cells at the block group level. Estimated population counts are obtained from a private vendor for each block group for each of the 32 cells. This level of aggregation was desired because the NHSDA first stage of sample selection was at the block group level, so that there would be data at this level to fit a model. In addition, there was a great deal of information from the Census at the block group level that could be used as predictors in the models. If substance use-related rates could be estimated for each of the 32 cells at the block group level, it would only be necessary to multiply by the estimated population counts and aggregate to the State level.

Another goal of the estimation process was to include the sampling weight in the model in such a way that the small area estimates would converge to the design-based (sample-weighted) estimate when they are aggregated to a sufficient sample size. There was a desire for the estimates to have this characteristic so that there would be consistency with the survey-weighted national estimates based on the entire sample.

A third goal was to include as much local source data as possible, especially data related to each substance use measure. This would help provide a better fit beyond the strictly sociodemographic

information. The desire was to use national sources of these data so that there would be consistency of collection and estimation methodology across States.

Recognizing that estimates based solely on these "fixed" effects would not reflect differences across States due to differences in laws, enforcement activities, advertising campaigns, outreach activities, and other such unique State contributions, a fourth goal was to include "random" effects to compensate for these differences. The types of random effects that could be supported by NHSDA data were a function of the size of sample and the model fit to the sample data. For the 1999 survey, random effects were included at the State level and for substate regions comprised of three (typically neighboring) FI regions. Although this grouping of the three FI regions was principally motivated by the need to accumulate enough sample to support good model fitting for the low prevalence NHSDA outcomes, it was also reasoned that it would be possible to produce substate HB estimates for areas comprised of these FI region groups, once 2 or 3 years of NHSDA data were available, because that would yield substate region samples of at least 400 respondents. For substate areas like counties and large municipalities that do not conform to the substate region boundaries, HB estimates could be derived from their elemental block group-level contributions, but the direct survey data employed in the estimation of the associated substate region effects would not be restricted to the county or city of interest. This mismatch of FI region and county/large municipality boundaries weakens the theoretical appeal of the associated HB estimate. For this reason, substate HB estimates probably should be restricted to areas that can be matched reasonably well to FI region groups.

One of the difficulties of typical SAE has been obtaining good estimates of the accuracy of the estimates with prediction intervals that give a good representation of the true probability of coverage of the intervals. Therefore, the final major goal was to provide accurate prediction intervals—ones that would approach the usual sample-based intervals as the sample size increases.

B.3 Predictors Used in Logistic Regression Models

Local area data used as potential predictor variables in the logistic regression models were obtained from several sources, including Claritas, the Census Bureau, the FBI (Uniform Crime Reports), Health Resources and Services Administration (Area Resource File), SAMHSA (Uniform Facility Data Set), and the National Center for Health Statistics (mortality data). The list of sources and the actual variables that were selected as independent predictors for each age group for the estimation of the treatment gap are provided below.

B.3.1 Sources of Data

- ***Claritas***: Demographic data package called *Building Block Basic, Age by Race* from Claritas for 1999 with projections to 2004; the estimates for 2000 population counts were used.
- ***Census Bureau***: 1990 Census, demographic and socioeconomic variables; July 1997 Food Stamp participation rates.

- ***Federal Bureau of Investigation***: Uniform Crime Report (UCR), UCR arrest totals from http://fisher.lib.Virginia.EDU/crime/ (the most current data are for 1997 for most counties, and previous years' data were used in a few cases).
- ***Health Resources and Services Administration***: Area Resource File (ARF), some variables relating to income and employment from the ARF February 2000 release from the Bureau of Health Professions, Office of Research and Planning.
- ***National Center for Health Statistics***: Mortality data using International Classification of Diseases, 9th revision (ICD-9), 1993 to 1998; ICD-9 death rate data from the Centers for Disease Control and Prevention at the National Center for Health Statistics.
- ***SAMHSA, Office of Applied Studies***: Uniform Facility Data Set (UFDS), 1997 to 1998 UFDS data on drug and alcohol treatment rates from Synectics for Management Decisions, Inc.

B.3.2 Predictor Variables in Final Model, by Age Group

Age Group 1 (Ages 12 to 17)

- 2001-2003 State cost of services index,
- gender,
- Hispanic,
- non-Hispanic black,
- non-Hispanic other (non-white, non-black),
- linear effect for males of the county opium/cocaine possession arrest rate,
- linear effect for non-Hispanic others of the percentage of the housing units in tract built in 1939 or earlier,
- linear effect for the Northeast region of the percentage of the tract population with some college and no degree,
- linear effect for the Southern region of the percentage of the block group population aged 55 to 64,
- linear effect for non-Hispanic blacks of the percentage of the block group population aged 19 to 24,
- linear effect for non-Hispanic others of the percentage of the county population aged 25 to 34,
- linear effect for Hispanics of the percentage of the county population who are black,
- linear effect for non-Hispanic others of the percentage of the county population who are black, and
- linear effect for the Northeast region of the percentage of the county population who are black.

Age Group 2 (Ages 18 to 25)

- quadratic effect of the percentage of the county population aged 19 to 24,
- quadratic effect of the percentage of the housing units that are rented in the tract,
- gender,
- Hispanic,
- non-Hispanic black,

- non-Hispanic other (non-white, non-black),
- linear effect for the Southern region of the percentage of families in the county below poverty level,
- linear effect for males of the percentage of the females in the tract older than 16 years old in the labor force,
- linear effect for males of the percentage of the tract population with an associate's degree,
- linear effect for the Northeast region of the percentage of the population in the block group aged 65 or older,
- linear effect for the Northeast region of the percentage of the population in the tract that is female, and
- resident in a county where the per capita income is in the 4^{th} or 5^{th} decile and the food stamp participation rate is in one of the lowest three deciles.

Age Group 3 (Ages 26 to 34)

- quadratic effect of the percentage of the persons in the tract aged 16 to 64 with a work disability,
- gender,
- Hispanic,
- non-Hispanic black, and
- non-Hispanic other.

Age Group 4 (Ages 35 or Older)

- linear effect of the percentage of the population in the block group aged 35 to 44,
- gender,
- Hispanic,
- non-Hispanic black,
- non-Hispanic other, and
- residence in a tract where the percentage of the population who are white is in one of the six lowest deciles, and the percentage of the population who are American Indian, Eskimo, or Aleut is in the 7^{th} decile or higher and the county is a metropolitan statistical area (MSA) with 1 million or more people.

B.4 Method of Selecting Independent Variables for the Models

For the 1999 SAE exercise, independent variables for modeling each of the substance use measures were first identified by a CHAID (Chi-squared Automatic Interaction Detector) algorithm. CHAID does not use sample weights. Prior to this process, all the continuous variables were categorized using deciles and were treated as ordinal in CHAID. Region was treated as a nominal categorical variables in CHAID. Significant independent variables from each model that were final nodes in the tree-growing process were identified as indicator variables destined for inclusion at a later step.

Independently, a SAS stepwise logistic regression model was fit for each dependent variable by age group. The SAS stepwise was used because it was able to quickly run all of the variables for

all of the models, although it was recognized that the software would not take into account the complex sample design and the weights. The independent variables included all the first-order or linear polynomial trend contrasts across the 10 levels of the categorized variables, as well as the gender, region, and race variables. Significant variables (at the 3 percent level) were identified from this process. Based on this list, another list of variables was created that included the second- and third-order polynomials and the interaction of the first-order polynomials with the gender, race, and region variables.

Next, the variables from the CHAID process and the SAS process were entered into a SAS stepwise logistic model at the 1 percent significance level. Because of past concerns about overfitting of the data in earlier estimation using the 1991 to 1993 NHSDA data, the significance levels were made quite stringent. These variables were then entered into a SUDAAN logistic regression model because the SUDAAN software would adjust for the effects of the weights and other aspects of the complex sample design. All variables that were still significant at the 1 percent significance level were entered into the survey-weighted HB process.

Independently, a factor-analytic approach was used to determine the important variables to include in the model. This approach would allow the data to self-identify the important dimensions. The concern here was to use an alternative method that would have a certain face validity. That method was utilized to identify an independent set of variables that were then processed through the HB estimation. The results, however, in terms of model-fit and prediction intervals were generally not as good as with the CHAID/SAS/SUDAAN screening process for candidate independent variables. Also, the factor-analytic approach involved an inherently subjective step to attribute names to the various factor loadings, and the interest was more in the predictive ability of variables than in a substantive description of the dimensions. Nevertheless, it was encouraging to see that the results of the two approaches gave reasonably similar results. For these reasons, the estimates in this report were those based on the latter method that started with the CHAID process.

To select variables for the 2000 treatment gap model, an alternative to the 1999 approach was also implemented. This alternative, designed to further reduce the risk of overfitting, involved splitting the 2000 sample into two halves with the 7,200 sample area segments (block clusters) used as sampling units for the splitting. One of those half-samples was designated the training sample, and its complement was assigned the role of validation sample. The 1999 variable selection strategy was then applied to the training sample with a less stringent 10 percent significance level for retaining variables. Note that with a sample size one-half as large, the training sample would yield standard errors for the logistic regression coefficients that were expected to be inflated by a factor of 1.4. Therefore, a training sample significance level of 7 percent would be expected to yield a significance level of 1 percent in the full sample. The 10 percent level was chosen for the training sample after trying several alternatives. Once the variables were chosen using the training sample, the model was refit on the validation sample and variables that were not significant at the 10 percent level were dropped. The two alternative models resulting from the 1999 variable selection method and the new 2000 alternative were both subjected to the internal benchmarking validation exercise described later in this appendix (Section B.7). The new method produced small area estimates that were noticeably less biased

for the 26 or older age groups and the 12 or older age groups. Based on this result, the alternative set of predictor variables was chosen.

B.5 General Model Description

The model can be characterized as a complex mixed model (including both fixed and random effects) of the form:

$$\lambda = X\beta + ZU$$

Each of the symbols represents a matrix or vector. The leading term $X\beta$ is the usual (fixed) regression contribution, and ZU represents *random* effects for the States and FI region groups that the data will support and for which estimates are desired. Not obvious from the notation is that the form of the model is a logistic model used to estimate dichotomous data. The λ vector has elements $\ln[\pi_{ijk}/(1-\pi_{ijk})]$, where the π_{ijk} is the propensity for the k^{th} person in the j^{th} FI composite region in the i^{th} State to engage in the behavior of interest (e.g., to use marijuana in the past month). Also not obvious from the notation is that the model fitting utilizes the final "sample" weights as discussed above. The "sample" weights have been adjusted for nonresponse and poststratified to known Census counts.

The estimate for each State behaves like a "weighted" average of the direct survey estimate in that State and the predicted value based on the national regression model. The "weights" in this case are functions of the relative precision of the sample-based estimate for the State and the predicted estimate based on the national model. The eight large States have large samples, and thus more "weight" is given to the sample estimate relative to the model-based regression estimate. The 42 small States and the District of Columbia put relatively more "weight" on the regression estimate because of their smaller samples. The national regression estimate actually uses national parameters that are based on the full sample of approximately 72,000 persons; however, the regression estimate for a specific State is based on applying the national regression parameters *to that State's "local" county, block group, and tract-level predictor variables* and summing to the State level. Therefore, even the national regression component of the estimate for a State includes "local" State data.

The goal then was to come up with the best estimates of β and U. This would lead to the best estimates of λ, which would in turn lead to the best estimate of π. Once the best estimate of π for each block group and each age/race/gender cell within a block group has been estimated, the results could be weighted by the projected Census population counts at that level to make estimates for any geographic area larger than a block group.

B.6 Implementation of Modeling

The solution to the equation for λ in the above section is not straightforward but involves a series of iterative steps to generate values of the desired fixed and random effects from the underlying joint distribution. The details of the technique will be described in more detail in a methodological report currently in progress. In the interim, the basic process can be described as follows.

Let β denote the matrix of fixed effects, η be the matrix of State random effects i = 1-51, and v denote the matrix of FI composite region effects j within State i. Because the goal is to estimate separate models for four age groups, it is assumed that the random effect vectors are four variate Normal with null mean vectors and 4X4 covariance matrices D_η and D_v, respectively. To estimate the individual effects, a Bayesian approach is used to represent the joint density function given the data by $f(\beta, \eta, v, D_v, D_\eta \mid y)$. According to the Bayes process, this can be estimated once the conditional distributions are known:

$$f_1(\beta \mid \eta, v, D_v, D_\eta, y), \; f_2(D_v, D_\eta \mid \beta\eta, v, y), \text{ and } f_3(\eta, v \mid \beta, D_v, D_\eta, y).$$

To generate random draws from these distributions, Markov Chain Monte Carlo (MCMC) processes need to be used. These are a body of methods for generating pseudo-random draws from probability distributions via Markov chains. A Markov chain is fully specified by its starting distribution $P(X_0)$ and the transition kernel $P(X_t \mid X_{t-1})$.

Each MCMC step that involves the vector of binary outcome variables y in the conditioning set needs first to be modified by defining a pseudo-likelihood using survey weights. In defining pseudo-likelihood, weights are introduced after scaling them to the effective sample size based on a suitable design effect. Note that with the pseudo-likelihood, the covariance matrix of the pseudo-score functions is no longer equal to the pseudo-information matrix; therefore, a sandwich-type of covariance matrix was used to compute the design effect. In this process, weights are largely assumed to be noninformative (i.e., unrelated to the outcome variable y). The assumption of noninformative weights is useful in finding tractable expressions for the appropriate information matrix of the pseudo-score functions. The pseudo-log-likelihood remains an unbiased estimate of the finite-population log-likelihood regardless of this assumption.

Step I $[\beta_a \mid \eta, v, y]$ (note that this does not depend oin D_η, D_v)

With flat prior for β_a, the conditional posterior is proportional to the pseudo-likelihood function. For large samples, this posterior can be approximated by the multivariate Normal distribution with mean vector equal to the pseudo-maximum likelihood estimate and with asymptotic covariance matrix having the associated sandwich form. Assuming that the survey weights are noninformative makes the age group specific β_a vectors conditionally independent of each other. Therefore, the β_a can be updated separately at each MCMC cycle.

Step II $[\eta_i \mid \beta, v_i, D_\eta, y]$ (this does not depend on D_v)

Here, the conditional posterior is proportional to the product of the prior $g(\eta_i \mid .)$, the pseudo-likelihood function $f(y \mid .)$ as well as the prior $p(\beta, D_\eta)$; this last prior can be omitted as it does not involve η_i. Calculating the denominator (or the normalization constant) of the posterior distribution for η_i requires multidimensional integration and is numerically intractable. To get around this problem, the Metropolis-Hastings (M-H) algorithm is used that requires a dominating density convenient for Monte Carlo sampling. For this purpose, the mode and curvature of the conditional posterior distribution are used; these can be simply obtained from its numerator. Then a Gaussian distribution is used with matching mode and curvature to define the dominating density for M-H. As with the age group specific β_a parameters, the State-specific random effect

vectors η_i are conditionally independent of each other and can be updated separately at each MCMC cycle.

Step III $[v_{ij} \mid \beta, \eta_i, D_v, y]$ (this does not depend on $D\eta$)

Similar to step II.

Step IV $[D\eta \mid \eta]$, $[D_v \mid v]$ (here, $\eta$and v include all the information from y)

Here, the pseudo-likelihood involving design weights comes in implicitly through the conditioning parameters $\eta$and v evaluated at the current cycle. An exact conditional posterior distribution is obtained because the inverse Wishart priors for $D\eta$ and D_v are conjugate.

Remarks

- In the NHSDA application, three FI regions were combined to form a minimum of four substate regions with corresponding random effects. This was done to ensure adequate sample sizes for estimation purposes.
- There is self-calibration built in to the modeling. This is achieved via design effect scaling of survey weights incorporated in the conditional posterior density so that small area estimates for large States become asymptotically equivalent to the direct estimates. Similarly, survey-weighted estimates of the fixed parameters (in particular, the intercept) give calibration of the aggregate of small area estimates to the national direct estimate.
- For posterior variance estimation purposes, the survey weights were largely assumed to be noninformative. The survey design effects on the posterior variance are therefore restricted to unequal weighting effects. It was assumed that all the design-related clustering effects are represented by between-State and between-substate (within State) variability of random effects. This does not take care of variability at lower levels of clustering. However, sample size is not sufficient at lower levels to support stable estimates of random effects for area segments.
- If the logistic mixed model fits well, the variance estimates should be reasonable. The self-calibration property provides some protection against model breakdown. Research is currently under way to develop a new MCMC algorithm that fully accounts for survey design effects on the small area estimate posterior prediction intervals.

B.7 Validation and Other Results

The following validation methodology was implemented at the time of the estimation of the 2000 percentage treatment gap and is specific to this measure. Validation was also conducted earlier at the time of the first release of the 1999 NHSDA data (OAS, 2000) and was based on the seven variables discussed in that report. Subsequently, an error in the imputation program was discovered and corrected, and the corrected file was used for the validation of the treatment gap estimation. Further information about the impact of the error on the previously released data from the 1999 NHSDA is provided in the 2000 Summary of Findings (OAS, 2001).

To validate the fit of the SAE models, the eight large sample States were used as internal benchmarks. For this purpose, 6 pseudo FI regions within each large sample State were created by pooling the 48 initial regions into 6 groups of 8. Each of these 6 pseudo-FI regions were then expected to have 16 area segments per calendar quarter. For each of these pseudo FI region-by-quarter sets of 16 area segments, any segments devoid of interviews were first randomly replaced by a selection from the non-empty segments in the set. The completed set of 16 segments from each pseudo-FI region-by-quarter combination was then randomly partitioned into 8 replicates of 2 segments each. When combined, each pair of large sample States had 12 pseudo-FI regions. By pooling one segment pair from each of the 48 pseudo-FI region-by-quarter combinations, 8 substate replicates were formed. Each of these 8 substate replicates mimicked the size and design structure of a small sample State.

Having created 8 pseudo-small State samples and associated universe-level files for each of the 4 paired States, SAEs were then produced for the 32 pseudo-States. Table B.4 shows these 32 substate SAEs and their direct survey-weighted analogs for the percentage treatment gap.[4] Relative absolute biases of the substate estimates are shown where the full State sample direct estimate is used as the benchmark value.

The State-specific relative absolute bias (RB) quantities in Table B.4 equal the absolute differences of the averaged eight substate small area estimates and the State full sample design-based benchmark (e.g., California and Texas) divided by the benchmark. The average relative absolute bias (ARB) is the simple average across the four combined-State pairs of the RBs. The average relative bias across the 32 pseudo-States was only about 4 percent. This implies, on average, for a pseudo-State (similar in design and sample size to the 42 small States and the District of Columbia) with an estimated 2 percent treatment gap that the true value in the population is within 0.08 percent.

To compare the overall precision of the small area estimates with the direct survey estimates, ratios of the corresponding 95 percent Bayes prediction intervals, which fully account for the posterior variance of the fixed and random effect parameters, were compared with the corresponding direct survey 95 percent confidence intervals. These results are displayed in Table B.5.

The SAE and direct intervals are summarized by showing average ratios of the *relative* interval widths (the interval width for a State divided by the corresponding estimate for that State) by State and overall averages of the ratios across States. The average relative width across the 32 pseudo-States is about 1.80. This indicates generally that the confidence intervals for direct design-based estimates based on the same sample size would be 1.8 times larger than the prediction intervals resulting from the HB approach. The HB estimates are equivalent in precision to a direct estimate based on a sample that is 3.3 times larger. The tables also present the average relative root mean square (RMSQ), a measure that takes into consideration both the (small) bias and the variance in the HB estimation.

B.8 Caveats

Table B.1 shows the screening, interview, and overall response rate for each State and the District of Columbia. As mentioned in the text, these variable response rates can be associated with variable levels of nonresponse bias. In addition, there may be varying levels of *response* bias as a result of underreporting (and sometimes overreporting) use of illicit substances. For 1999 and 2000, the assumption being made is that the biases from these two sources are constant across States so that comparisons among States still hold.

Another possible contributor to bias in the State estimates, and the estimates in general, was the effect of editing and imputation. In developing the editing and imputation process, the desire was to minimize the amount of editing, typically somewhat subjective, and instead let the random imputation process supply any partially missing information. Overall, the percentage of imputed information was quite small for most substances. For example, respondents may have indicated that they used the drug in their lifetime or in the past year, but left blank the question about use in the past month. The method is based on a multivariate imputation in which some demographic and other substance use information from the respondent is used to determine a donor who is similar in those characteristics but has supplied data for the drug in question. Often, information was also available from the partial respondent on the recency of drug use. For many of the records, this auxiliary information was available. For a small portion, no auxiliary information was available, in which case a random donor with similar drug use patterns and demographic characteristics was used.

Table B.1 2000 NHSDA Weighted CAI Screening and Interview Response Rates, by State

State	Screening Response Rate	Interview Response Rate	Overall Response Rate	State	Screening Response Rate	Interview Response Rate	Overall Response Rate
Total	92.84	73.93	68.64	Missouri	92.25	70.80	65.31
Alabama	95.50	77.98	74.47	Montana	94.91	80.21	76.13
Alaska	95.43	80.24	76.58	Nebraska	93.13	74.58	69.46
Arizona	92.99	73.78	68.61	Nevada	92.08	74.44	68.54
Arkansas	97.19	81.00	78.73	New Hampshire	92.41	75.12	69.42
California	90.99	69.50	63.24	New Jersey	91.96	66.56	61.21
Colorado	94.84	75.26	71.37	New Mexico	97.43	80.80	78.72
Connecticut	89.83	71.36	64.10	New York	88.78	73.73	65.46
Delaware	92.91	68.25	63.42	North Carolina	94.51	73.19	69.17
District of Columbia	93.50	85.56	80.00	North Dakota	94.43	79.46	75.03

Florida	94.64	75.73	71.67	Ohio	94.89	75.79	71.92
Georgia	92.95	69.76	64.84	Oklahoma	93.06	74.85	69.66
Hawaii	91.95	78.45	72.14	Oregon	91.87	73.91	67.90
Idaho	93.94	74.45	69.94	Pennsylvania	94.37	73.50	69.36
Illinois	88.71	65.59	58.19	Rhode Island	91.26	74.11	67.63
Indiana	92.62	73.87	68.42	South Carolina	94.69	77.84	73.71
Iowa	94.78	80.00	75.83	South Dakota	95.15	76.67	72.95
Kansas	92.28	73.45	67.79	Tennessee	90.25	72.45	65.39
Kentucky	95.79	84.14	80.59	Texas	94.72	78.12	74.00
Louisiana	95.04	80.81	76.80	Utah	95.11	83.44	79.36
Maine	92.39	78.46	72.49	Vermont	92.62	80.80	74.83
Maryland	94.88	76.88	72.94	Virginia	91.44	75.18	68.75
Massachusetts	89.77	66.45	59.65	Washington	93.59	75.45	70.61
Michigan	93.19	73.18	68.20	West Virginia	95.19	78.17	74.41
Minnesota	94.66	80.62	76.32	Wisconsin	94.33	75.06	70.81
Mississippi	93.60	79.14	74.07	Wyoming	95.41	76.61	73.09

Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.

Table B.2 Estimated Numbers (in Thousands) of Persons Aged 12 or Older, by Age Group and State: 2000

State	Total	Age Group (Years)		
		12-17	18-25	26 or Older
Total	223,280	23,368	28,984	170,927
Alabama	3,654	371	476	2,807
Alaska	491	63	71	357
Arizona	3,866	434	516	2,916
Arkansas	2,159	225	279	1,655
California	25,736	2,851	3,513	19,371
Colorado	3,411	358	452	2,601
Connecticut	2,701	257	308	2,136

Delaware	630	65	79	487
District of Columbia	424	44	58	321
Florida	12,693	1,178	1,368	10,147
Georgia	6,354	680	863	4,811
Hawaii	975	95	115	764
Idaho	1,083	130	165	789
Illinois	9,768	998	1,306	7,465
Indiana	4,949	512	665	3,772
Iowa	2,390	249	319	1,822
Kansas	2,155	240	293	1,622
Kentucky	3,287	329	435	2,524
Louisiana	3,561	418	519	2,624
Maine	1,047	103	122	822
Maryland	4,281	421	510	3,349
Massachusetts	5,119	504	611	4,004
Michigan	7,918	832	1,032	6,053
Minnesota	3,954	431	539	2,985
Mississippi	2,270	259	323	1,688
Missouri	4,534	476	596	3,462
Montana	776	85	100	591
Nebraska	1,376	154	189	1,032
Nevada	1,544	146	184	1,214
New Hampshire	1,007	105	120	782
New Jersey	6,717	629	783	5,305
New Mexico	1,490	174	211	1,105
New York	14,782	1,476	1,825	11,480
North Carolina	6,365	651	777	4,936
North Dakota	535	62	77	396
Ohio	9,292	951	1,212	7,129
Oklahoma	2,744	306	367	2,072
Oregon	2,827	276	355	2,197
Pennsylvania	10,117	988	1,186	7,943
Rhode Island	821	84	95	642
South Carolina	3,130	326	386	2,418
South Dakota	619	73	88	458

Tennessee	4,657	464	598	3,595
Texas	16,057	1,877	2,368	11,813
Utah	1,715	248	326	1,142
Vermont	512	55	63	394
Virginia	5,648	563	691	4,395
Washington	4,784	487	606	3,691
West Virginia	1,553	141	195	1,216
Wisconsin	4,376	476	590	3,310
Wyoming	425	49	61	315
Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.				

Table B.3 Survey Sample Size for Persons Aged 12 or Older, by Age Group and State: 2000

State	Total	Age Group (Years)		
		12-17	18-25	26 or Older
Total	71,764	25,717	22,613	23,434
Alabama	936	294	337	305
Alaska	833	294	257	282
Arizona	927	292	303	332
Arkansas	960	310	364	286
California	5,022	2,365	1,354	1,303
Colorado	911	278	298	335
Connecticut	891	299	262	330
Delaware	928	321	297	310
District of Columbia	918	259	340	319
Florida	3,478	1,194	1,140	1,144
Georgia	1,145	520	330	295
Hawaii	945	309	307	329
Idaho	894	311	283	300
Illinois	3,660	1,262	1,128	1,270
Indiana	1,061	405	353	303
Iowa	921	284	324	313
Kansas	897	291	323	283
Kentucky	1,018	341	345	332

Louisiana	939	356	278	305
Maine	901	321	234	346
Maryland	967	332	317	318
Massachusetts	1,002	378	298	326
Michigan	3,576	1,234	1,090	1,252
Minnesota	893	297	306	290
Mississippi	917	309	320	288
Missouri	893	314	302	277
Montana	914	276	334	304
Nebraska	906	311	291	304
Nevada	925	305	284	336
New Hampshire	883	280	246	357
New Jersey	1,200	553	289	358
New Mexico	874	315	267	292
New York	3,589	1,160	1,142	1,287
North Carolina	1,043	418	326	299
North Dakota	896	288	320	288
Ohio	3,678	1,227	1,215	1,236
Oklahoma	973	303	374	296
Oregon	864	288	275	301
Pennsylvania	3,997	1,474	1,195	1,328
Rhode Island	950	293	324	333
South Carolina	855	275	269	311
South Dakota	855	289	272	294
Tennessee	947	367	285	295
Texas	4,020	1,498	1,307	1,215
Utah	1,031	362	372	297
Vermont	981	344	320	317
Virginia	1,047	437	274	336
Washington	1,006	408	289	309
West Virginia	950	322	286	342
Wisconsin	1,119	453	312	354
Wyoming	828	301	255	272
Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.				

Table B.4 Simulated Substate Prevalence Rates, Relative Absolute Bias, and Root Mean Square for Persons Needing But Not Receiving Treatment for an Illicit Drug Problem in the Past Year: 2000

	Needing But Not Receiving Treatment for an Illicit Drug Problem			
	Total	**12-17**	**18-25**	**26 or Older**
California and Texas SAE	2.18	5.30	4.79	1.21
California and Texas DBE	2.01	5.34	4.95	0.95
CA_TX1	2.25	4.69	4.20	1.51
CA_TX2	2.27	6.24	5.17	1.12
CA_TX3	2.34	5.97	5.09	1.27
CA_TX4	2.59	5.37	5.71	1.59
CA_TX5	2.13	5.11	4.93	1.16
CA_TX6	2.12	4.98	4.69	1.21
CA_TX7	1.96	4.36	4.43	1.13
CA_TX8	2.09	5.28	4.20	1.21
RMSQ	13.75	11.03	10.36	38.26
REL ABS BIAS	10.46	1.66	3.06	34.08
New York and Florida SAE	1.84	3.90	6.78	0.85
New York and Florida DBE	1.82	3.48	7.04	0.85
NY_FL1	1.70	3.98	6.23	0.76
NY_FL2	1.88	4.04	6.94	0.87
NY_FL3	1.93	4.51	7.36	0.81
NY_FL4	1.88	3.93	6.69	0.92
NY_FL5	1.82	3.66	6.30	0.93
NY_FL6	1.69	4.13	5.80	0.78
NY_FL7	1.59	3.68	5.37	0.77
NY_FL8	2.02	3.78	7.52	0.99
RMSQ	7.37	15.84	12.32	9.65
REL ABS BIAS	0.37	13.97	7.33	0.94
Ohio and Michigan SAE	1.64	3.84	5.44	0.70

Ohio and Michigan DBE	1.66	4.00	5.59	0.67
OH_MI1	1.52	3.21	5.34	0.64
OH_MI2	1.72	3.91	5.27	0.82
OH_MI3	1.75	3.98	5.49	0.81
OH_MI4	1.59	4.35	5.00	0.63
OH_MI5	1.60	4.46	5.16	0.61
OH_MI6	1.62	3.49	5.73	0.66
OH_MI7	1.80	3.21	6.01	0.89
OH_MI8	1.63	3.91	5.25	0.70
RMSQ	5.31	12.04	6.37	16.34
REL ABS BIAS	0.37	4.68	3.25	7.16
Pennsylvania and Illinois SAE	1.74	3.40	5.92	0.86
Pennsylvania and Illinois DBE	1.70	3.17	5.84	0.85
PA_IL1	1.83	3.02	5.67	1.05
PA_IL2	1.69	4.03	5.05	0.84
PA_IL3	1.69	3.22	6.47	0.72
PA_IL4	1.75	3.85	5.74	0.83
PA_IL5	2.03	4.10	6.98	0.96
PA_IL6	1.65	3.06	5.47	0.86
PA_IL7	1.77	3.23	6.85	0.77
PA_IL8	1.78	3.39	5.23	1.01
RMSQ	7.65	16.41	11.93	13.63
REL ABS BIAS	4.11	10.08	1.54	4.09
AVERAGE RMSQ	8.52	13.83	10.24	19.47
AVERAGE REL ABS BIAS	3.83	7.60	3.79	11.57

Note: Relative Absolute Bias = |(Combined State Design-Based Estimate (DBE) - Mean of Eight Substate Small Area Estimates (SAE)|/Combined State Design-Based Estimate.

Note: Root Mean Square (RMSQ) = Sqrt(Mean Squared Differences of Substate Small Area Estimates with Respect to Combined State Design-Based Estimates)/Combined State Design-Based Estimate.

Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.

Table B.5 Ratio of Relative Width of Design-Based Confidence Intervals to Small Area Estimation Prediction Intervals for Persons Needing But Not Receiving Treatment for an Illicit Drug Problem in the Past Year: 2000

	Ratio of Relative Width			
	Total	**12-17**	**18-25**	**26 or Older**
CA_TX1	1.35	1.60	1.95	1.03
CA_TX2	1.37	1.13	1.09	5.19
CA_TX3	1.42	1.38	1.58	1.89
CA_TX4	1.69	1.61	1.81	1.87
CA_TX5	1.19	1.15	1.57	2.37
CA_TX6	1.63	1.13	1.77	2.69
CA_TX7	1.54	1.43	2.04	2.73
CA_TX8	1.78	1.41	1.94	3.17
California and Texas	1.37	1.09	1.18	1.83
AVERAGE OVER 8 SUBSTATES	1.50	1.35	1.72	2.62
NY_FL1	1.39	1.91	1.30	5.42
NY_FL2	2.57	1.77	1.26	2.99
NY_FL3	1.42	1.91	1.65	2.57
NY_FL4	2.96	2.17	1.65	2.89
NY_FL5	2.42	2.41	1.55	2.74
NY_FL6	2.00	1.61	1.36	3.55
NY_FL7	1.54	1.85	1.84	2.62
NY_FL8	1.73	2.18	1.40	1.88
New York and Florida	1.61	1.27	1.16	1.75
AVERAGE OVER 8 SUBSTATES	2.01	1.97	1.50	3.08
OH_MI1	2.34	1.74	2.24	5.12
OH_MI2	2.16	1.90	1.24	2.18
OH_MI3	2.15	1.30	1.78	2.73
OH_MI4	2.03	1.70	1.65	5.23
OH_MI5	1.55	1.17	1.99	*
OH_MI6	1.59	1.49	1.42	5.48
OH_MI7	1.84	2.20	1.17	1.73
OH_MI8	1.55	1.49	1.80	1.17
Ohio and Michigan	1.37	1.22	1.01	1.42
AVERAGE OVER 8 SUBSTATES	1.90	1.62	1.66	3.38

PA_IL1	1.63	2.36	1.79	1.23
PA_IL2	2.52	1.86	2.24	3.75
PA_IL3	1.74	2.00	1.46	*
PA_IL4	1.59	1.34	2.12	2.31
PA_IL5	1.66	1.49	1.29	2.11
PA_IL6	1.79	2.12	1.32	1.94
PA_IL7	1.90	2.51	1.37	5.44
PA_IL8	2.12	1.94	1.49	1.76
Pennsylvania and Illinois	1.48	1.38	1.30	1.36
AVERAGE OVER 8 SUBSTATES	1.87	1.95	1.64	2.65

* Relative width not computed due to design-based estimate of zero.

Note: Relative Width Ratio = (Length of Design-Based Confidence Interval/Design-Based Estimate)/(Length of Small Area Estimate Prediction Interval/Small Area Estimate).

Source: SAMHSA, Office of Applied Studies, National Household Survey on Drug Abuse, 2000.

Appendix B: End Notes

[3] The panel included William Bell of the U.S. Bureau of the Census; Partha Lahiri of the University of Nebraska; Balgobin Nandram of Worcester Polytechnic Institute and the National Center for Health Statistics; Wesley Schaible, formerly Associate Commissioner for Research and Evaluation at the Bureau of Labor Statistics; and Alan Zaslavsky of Harvard University. Other attendees involved in the development or discussion were Ralph Folsom, Judith Lessler, Avinash Singh, and Akhil Vaish of RTI and Doug Wright of SAMHSA.

[4] The validation results were based on a preliminary model; therefore, the combined State estimates shown in Table B.4 generally will not agree with estimates made by combining the corresponding State estimates from Table 6 or 7 in Chapter 3.